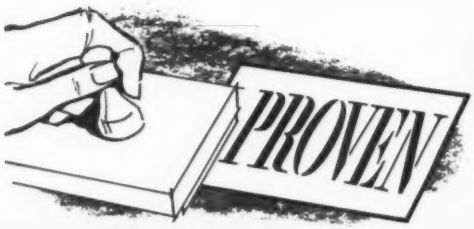
June 1959

ilway TRACK and STRUCTURES

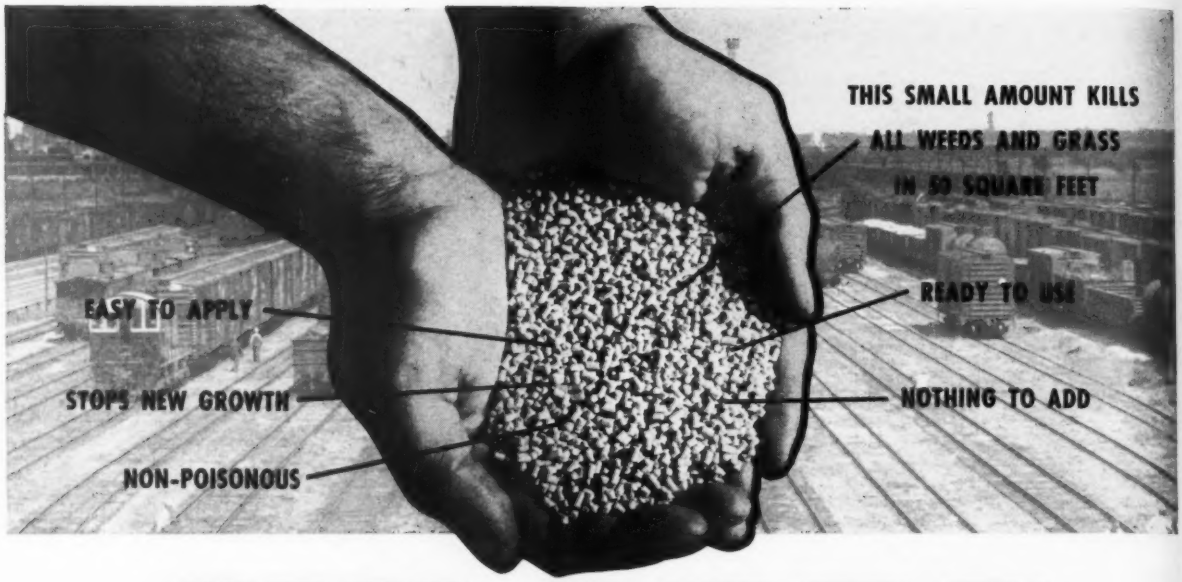
Curved aluminum canopies
p. 28

Removing foul ballast from tunnels
p. 24

A Simmons-Boardman TIME-SAVER Publication



WEED & GRASS KILLER



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CHLOREA GRANULAR is a pelletized weed and grass killer. The pellets are ready for use . . . no mixing or adding of water is required. Application is easy to make with simple equipment, or by hand. These important advantages combined with powerful "kill all" effectiveness have been fully demonstrated by extensive use on many leading railroads.

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2. Particularly intended for use where large scale spray application is impractical . . . such as freight yards, terminals, storage yards, under bridges and trestles, around warehouses, stations and other similar places.
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5. Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow rooted grasses, weeds and annual seedling growth.

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RAILROAD DIVISION HEADQUARTERS

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Heat-treated Rails Last 2 to 4 Times Longer on N & W

Here at Looney's Curve, W. Va., one of the last of Norfolk & Western's great 2-6-6-4's hauls its heavy drag over an installation of Bethlehem heat-treated 132 RE rails. These rails were laid in this compound 4-7-12 degree curve in August 1954—nearly five years ago. Since then, more than 100,000,000 gross tons of traffic have pounded their way through the curve!

Formerly, untreated rails at this same spot had to be replaced 6-9 months on the low side, and 12-15 months on the high side of the curve. The heat-treated rails—despite the beating they have already taken—clearly show that they can stay on the job for several years more!

Impressive as it is, this case is not exceptional. Railroads all over the country are slashing maintenance costs with heat-treated rails and track-work. Bethlehem, a pioneer in rail treatment, can supplement the N&W success story with others equally convincing. Just contact our nearest office, or write to the address below.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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SEABOARD FINDS THE ANSWER IN PRESSURE GROUTING

Seaboard Air Line Railroad began their program of pressure grouting with portland cement in 1946. Water pockets and soft spots in roadbeds had been major sources of trouble. On many of the curves, slow orders were necessary during every wet spell. Maintenance crews had to be sent back to the same trouble spots time after time.

Seaboard's grouting program has paid off and the cost has been low. Previously unstable track now requires little or no maintenance. Schedules are maintained, no matter what the weather. Every division has its own grouting outfit and uses it to cut down maintenance costs. It's just one of the many important ways that progressive railroads are using portland cement and concrete to build for economy . . . for durability . . . for better service.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

Railway TRACK and STRUCTURES

JUNE 1959 • Vol. 55, No. 6

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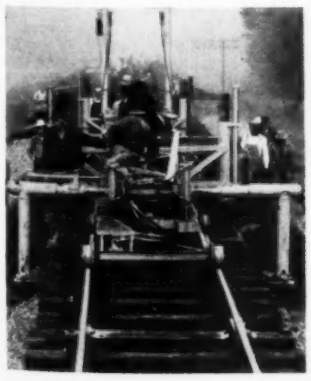

On the B&O: Mechanization—'Package' style 21
With $3½ million worth of equipment, all leased, this road has completely mechanized its track forces. Machines are used in "package" units.

How Clinchfield removes foul ballast from tunnels 24
This road had to find an economical method of removing old ballast from many tunnels. Chief Engineer Salmon tells how he solved the problem.

Curved aluminum canopies for passenger platforms 28
Design selected for use by Jersey Central at Elizabethport, N. J., is modern, practically maintenance-free, and affords clear walking area.

Now—A fixed butt-welding plant 30
A new service is available at Chicago in the form of a commercial stationary plant established to produce welded rail on a cost-per-weld basis.

What can you do about scour? 32
Out of 50 years experience a retired engineer gives some pointers on how to deal with a problem that's particularly severe in the Southwest.

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◀ Don't miss . . .

There's been a further step in the evolution of the undertrack plow. It's now available with a tie ejector and a track liner, all operated as a single unit. It's already in use on several roads.

. . . in the July issue

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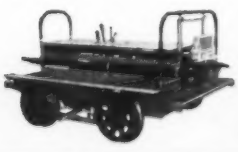
For full time inspection over all locations

Three *balanced* features—power, strength and weight—make the Fairmont M19 Series AA Inspection Motor Car the smoothest running, most powerful 1 to 4 man vehicle you can get for this purpose.

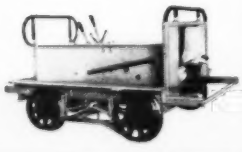
The *abundant power* for efficient operation comes from the 10 to 14 H.P. 2-cylinder engine. Exceptional smooth running in forward and reverse results from the almost complete elimination of vibration by having both cylinders fire at the same time. The *ample strength* for long, trouble-free service, the *reasonable weight* for easy handling, stem from the frame of heat-treated aluminum alloy. Other parts made of aluminum for light weight with strength are the cylinders, crankcase, piston and rods.

Representative of the accessories available for this ca are aluminum windshield, windshield wiper, rail sweep and side seats (see picture). Whether it's an accessor or original equipment, you can be sure every part i built to Fairmont's special standards to assure depend able on-the-job performance, regardless of grades o headwinds. Write today for facts on the exclusiv advantages you get with Fairmont M19 Series A Inspection Cars.

M14 SERIES H LIGHT SECTION CAR is ideal for small gangs of two to six men where ease of handling is a major consideration.

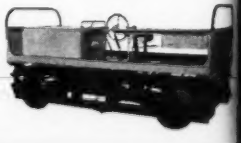


S2 SERIES AA STANDARD SECTION CAR can seat eight men, has a load capacity of 1800 lbs. Two cylinder engine gives smooth operation.



A5 SERIES C MEDIUM-DUTY GANG CAR pulls loaded trailers with ease. Four cylinder engine, four speed transmission, full reverse.

A8 SERIES B HEAVY-DUTY GANG C is just that. Has 162 h.p. V-8 engi four speeds either direction, and fo wheel drive.



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Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

•

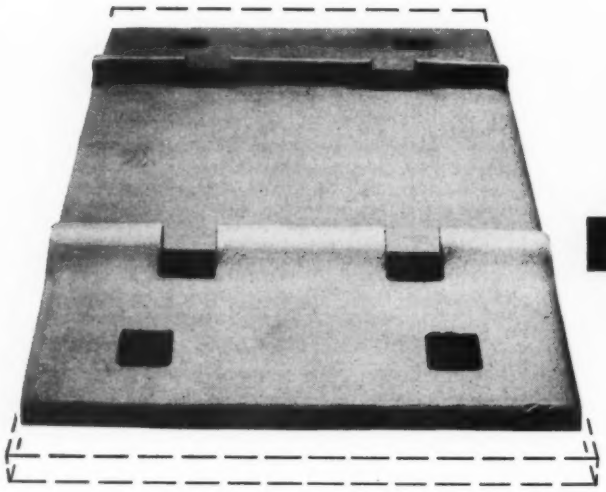
PRESERVING PILE CUTOFFS. The treatment of pile cutoffs with Osmosplastic is the subject of a brochure now available. Memorandum No. 4 briefly describes the development of fungus decay at pile cutoffs and gives a quick summary of the need for preservative treatment at this point. It also covers some of the past practices used for this work. The advantages of using Osmosplastic to accomplish the treatment is presented along with illustrations which show its application to a pile cutoff. Cost, coverage and application time are also given in the brochure. (Write: *Osmose Wood Preserving Company of America, Inc., Bridge Inspection & Treating Division, Dept. RTS, 980 Ellicott St., Buffalo, N.Y.*)

EARTHMOVING EQUIPMENT. The improved features and production advantages of the new Caterpillar DW21 Series G Tractor in combination with the No. 470 Series B Scraper are pointed out in an 8-page booklet entitled "Out Front For '59." The 2-color booklet, Form D915, describes the new features of the combination and illustrates its use under widely varying soil and climatic conditions, with many on-the-job photographs. A cutaway drawing is included, which shows the operation of the dry-type air cleaner. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.*)

WATERTIGHT MASONRY. The role played by Omicron Mortarproofing in providing a cohesive plastic mortar is described in a 6-page bulletin now available. The bulletin, O.M.-8A outlines the major considerations in designing tight masonry walls, citing good workmanship and a minimum of cracks between the brick and mortar as the principal pre-requisites to obtaining watertight masonry. Also discussed in the bulletin are mortar ingredients and proportioning, compatibility of brick and mortar, control of shrinkage and bleeding, separation cracks, effect of mechanical disturbance and the importance of proper protection. A list of jobs where the material was used is included. (Write: *The Master Builders Company, Dept. RTS, Cleveland 3, Ohio*)

ELECTRIC HOISTS. The features of the Northern Hi-Lift, low headroom, heavy duty electric hoists are described and illustrated in a booklet now available. The booklet contains a catalog of hoists and engineering data regarding them. Pictures show the various types of hoists in the manufacturer's line, including a one-motor floor-controlled hoist for I-beam track, a base-mounted hoist unit and a two-motor cab-controlled hoist with power travel. Also shown are several types of installations. (Write: *Northern Engineering Works, Dept. RTS, 210 Chene St., Detroit 7, Mich.*)

ELECTRONIC WEIGHING. Two pieces of literature are available which describes and illustrates electronic weighing. One is a 12-page booklet on "Industrial Weighing Through Electronics." It explains the history and development of electronic weighing, theory of operation, instrumentation, economic considerations and general data for instrumentation and remote recording. The other piece of literature is a 6-page brochure entitled "The Way to Weigh." It contains photographs and descriptions of weight recording equipment and typical applications. (Write: *Streeter-Amet Company, Dept. RTS, Grayslake, Ill.*)



(SMALLER TIE PLATES)

(RACOR TIE PADS)

Here's how you can save $1,320 or more on every mile of track re-laid

Are you short of funds for M/W upgrading? If your present rail relaying plans call for larger tie plates, we urge you to seriously consider using your *present* plates with Racor® tie pads. You will get far better tie protection, and you will save money, too. New large quantity discounts on top-quality Racor tie pads now make out-of-face installations economically sound. The accompanying table shows how big some of these savings can be!

Do you have usable tie plates on hand? If you have a stock of smaller tie plates which you have "outgrown", you can upgrade them by several sizes through the use of Racor tie pads.

As the A.R.E.A. test at London, Kentucky, shows, small tie plates *plus* proper tie pad protection equal longer tie life, elimination of plate cutting, and far lower track maintenance costs. Experience indicates that a reduction of one, two or even three inches in plate size may be practical under many conditions. Thus it is often possible to effect very substantial savings while realizing the many benefits of Racor tie pad protection.

Do you want to reduce future M/W expenses? The new low quantity prices on Racor tie pads now make out-of-face installation of tie pads economically feasible in a great many heavy traffic main line locations. In an effort to reduce plate cutting and the resulting higher costs for maintaining main line track in top condition, many roads are considering larger or heavier tie plates. By providing better tie protection and lower maintenance requirements, Racor tie pads at their new low prices provide a more economical alternative.

To help you take full advantage of these new quantity prices on Racor tie pads, your American Brake Shoe representative will be glad to go over your situation with you and prepare a comprehensive cost analysis for your evaluation. For full details consult American Brake Shoe Company, Railroad Products Division, 530 Fifth Avenue, New York 36, New York.

(IMPORTANT INITIAL SAVINGS)

TYPICAL EXAMPLES OF SAVINGS, DOLLARS PER MILE*

WITH 115 POUND RAIL:			WITH 132 OR 133 POUND RAIL:		
USING THIS SIZE TIE PLATE AND RACOR TIE PAD	INSTEAD OF THIS SIZE TIE PLATE ALONE	SAVES YOU THIS MUCH PER MILE	USING THIS SIZE TIE PLATE AND RACOR TIE PAD	INSTEAD OF THIS SIZE TIE PLATE ALONE	SAVES YOU THIS MUCH PER MILE
No. 4 11" Light	No. 7 13" Heavy	$1,320	No. 9 12" Light	No. 12 14" Heavy	$1,360
No. 4 11" Light	No. 8 14" Ex. Hvy.	2,795	No. 9 12" Light	No. 13 14¾" Ex. Hvy.	2,260
No. 4 11" Light	No. 20 15" Heavy	4,795	No. 9 12" Light	No. 21 16" Heavy	4,965
No. 6 12" Medium	No. 7 13" Heavy	40	No. 10 13" Medium	No. 13 14¾" Ex. Hvy.	843
No. 6 12" Medium	No. 8 14" Ex. Hvy.	1,510	No. 10 13" Medium	No. 21 16" Heavy	3,543
No. 6 12" Medium	No. 20 15" Heavy	3,490	No. 11 13" Medium	No. 13 14¾" Ex. Hvy.	593
No. 7 13" Heavy	No. 20 15" Heavy	1,793	No. 11 13" Medium	No. 21 16" Heavy	3,293
No. 8 14" Ex. Hvy.	No. 20 15" Heavy	193	No. 12 14" Heavy	No. 21 16" Heavy	1,813

**Tie pad prices based on quantities required for ten miles of track. Tie plate prices F.O.B. mill for 7¼" sizes.*

A-2989

Quality products cut your ton-mile costs

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NEWS ABOUT PEOPLE

CANADIAN NATIONAL — David D. Low, assistant superintendent at Estevan, Sask., has been promoted to transportation and engineering assistant at Victoria, B.C., succeeding **Donald H. Eckford** who has been promoted to division engineer at Kamloops, B. C. Mr. Eckford succeeds **A. Grant McIntyre** who has been promoted to assistant district engineer at Vancouver, B. C.

G. L. P. Plow, assistant chief engineer at Montreal, Que., has assumed the combined duties of the two former positions of assistant chief engineer there. This is the result of the temporary assignment of **H. J. Fast** to the department of research and development as coordinator of work study, as announced in the May issue. **W. J. Wanamaker,** office engineer at Toronto, Ont., has been promoted to assistant to chief engineer there, succeeding **F. S. Hutton** who has been promoted to engineer maintenance of way. Mr. Hutton succeeds **J. L. Cann** whose promotion to project director in charge of the terminal project at Toronto was announced in the April issue.

CANADIAN PACIFIC — G. R. W. Partridge, division engineer at Toronto, Ont., has been promoted to superintendent, piggyback services, with headquarters at Montreal, Que., succeeding **A. E. Jenner.**

CHESAPEAKE & OHIO—The following have recently retired: **Leo P. Morrison,** water service supervisor at Grand Rapids, Mich., after 51 years of service; **George W. Higgins,** supervisor bridges and buildings at Traverse City, Mich., after more than 59 years of service; **Howard G. Bowles,** supervisor track at Huntington, W. Va., after 48 years of service.

ELGIN, JOLIET & EASTERN—Donald C. Morgan, junior engineer, has been promoted to the newly created position of assistant supervisor of track—system, with headquarters as assigned.

ERIE—Frederick W. Lichtenberger, assistant master carpenter at Paterson, N. J., has been promoted to master carpenter at Marion, Ohio, succeeding **Clayton G. Bucher** who has retired after 32 years of service. Mr. Lichtenberger's former position is abolished. **Howard M. Shepard,** assistant chief engineer at Cleveland, Ohio, has retired after 46 years of service.

FRISCO—D. L. Walker, assistant general foreman bridges and buildings at Fort Smith, Ark., has been promoted to general foreman bridges and buildings and water service there.

GRAND TRUNK WESTERN—A. L. Ray, division engineer at Detroit, Mich., has been promoted to assistant engineer maintenance of way there.

LOUISVILLE & NASHVILLE—William H. Kendall, vice-president and general manager, and an engineer by training and experience, has been elected president, succeeding **John E. Tilford** who recently retired.

MILWAUKEE—E. C. Jordan, assistant division engineer at Minneapolis, Minn., has been promoted to division engineer at Savanna, Ill., succeeding **K. L. Clark** who has been transferred to Bensenville, Ill. Mr. Clark succeeds **N. E. Smith** who has been promoted to principal assistant engineer at Chicago, succeeding **W. E. Fuhr** who has been advanced to assistant chief engineer—signals and communication. Mr. Fuhr succeeds **B. J. Worley** who has been promoted to engineer maintenance of way—track, succeeding **V. E. Glosup** who has been advanced to general manager—Lines East, with headquarters at Chicago.

MISSOURI PACIFIC—T. L. Gibson has been appointed division engineer of the Union Railway, a subsidiary of the MP, at Memphis, Tenn., succeeding **P. P. Wagner, Jr.,** who has been transferred to Falls City, Neb. Mr. Wagner succeeds **R. J. Kemper** who has been promoted to district engineer at Little Rock, Ark., succeeding **R. H. Carpenter** who has been promoted to engineer maintenance of way at St. Louis, Mo. Mr. Carpenter succeeds **A. B. Chaney,** retired.

NORTH WESTERN—John P. Hanges, roadmaster at Waukegan, Ill., has been transferred to Iron Mountain, Mich., succeeding **E. J. Grall.** Mr. Grall was transferred to Marinette, Wis., as announced in the May issue.

SANTA FE—William S. Autrey, regional engineer at Los Angeles, Calif., has been granted a leave of absence to attend the Massachusetts Institute of Technology under an Alfred P. Sloan fellowship in executive development. **Ralph F. Correll,** assistant engineer at Topeka, Kan., has been promoted to assistant office engineer there succeeding **Turner P. Burgess** who has been promoted to bridge engineer, Eastern Lines, with the same headquarters.

SOUTHERN—James M. Peek, general division engineer at Charlotte, N. C., has been promoted to assistant chief engineer, maintenance of way and structures, at Knoxville, Tenn. **Philip T. Sarris,** assistant division engineer at Knoxville, Tenn., has been promoted to division engineer there. **Doyle A. Chambers,** assistant division engineer at Valdosta, Ga., has been transferred to Knoxville, Tenn. **Edward A. Wiesman,** assistant engineer, Washington, D. C., retired recently after 38 years of service.

SOUTH SHORE—Loren F. Pohl, office engineer way and structures at Michigan City, Ind., has been promoted to chief engineer way and structures with the same headquarters. Mr. Pohl succeeds **F. J. Corporon,** superintendent way and structures, who has resigned to join Motorola Communications & Electronics, Inc., as communications representative at Chicago.

UNION PACIFIC—G. D. Scheer, industrial engineer at Kansas City, Mo., has been promoted to division engineer at Los Angeles, Calif., succeeding **F. G. Schurman** who has been transferred to the Nebraska division. **Don MacDonald,** assistant industrial engineer at Denver, Colo., has been promoted to division engineer of the Kansas division.

WESTERN MARYLAND—R. M. Johnson has been appointed supervisor of work equipment—system with headquarters at Cumberland, Md.

Obituary

Lewis E. Williams, 51, supervisor track on the Chesapeake & Ohio at Maysville, Ky., died on April 16.

Biographical Briefs

Charles E. Weller, 43, who was recently promoted to assistant engineer maintenance of way on the Illinois Central at Chicago (*RT&S*, Apr., p. 10), was born at Mannington, W. Va., and graduated from Pennsylvania State in 1937. Mr. Weller entered the service of the Illinois Central in 1937 and two years later was appointed chainman at Champaign, Ill. He was promoted to rodman at Waterloo, Iowa, in 1940 and the following year further advanced to assistant supervisor on the Iowa division, serving also in this capacity on the Springfield, Chicago Terminal and the Illinois divisions. In 1942 he entered military service and served with the 715th Railway Operating Battalion in Africa and Italy. Mr. Weller returned to the Illinois Central in 1946 and was appointed supervisor of track at DuQuoin, Ill. He was transferred to East St. Louis, Ill., the following year and was promoted to division engineer of the Chicago Terminal in 1949. Mr. Weller was serving as division engineer at Waterloo, Iowa, at the time of his recent promotion.

Alfred C. Danks, Jr., 50, who was recently promoted to engineer bridges and buildings of the Union Railroad at East Pittsburgh, Pa. (*RT&S*, Mar., p. 10), was born at Wilkinsburg, Pa. He graduated from the Carnegie Institute of Technology night school in 1940 with a Bachelor of Science degree in civil engineering. Mr. Danks entered the service of the Union in 1937 as an assistant engineer at Pittsburgh, Pa. In 1941 he was appointed draftsman at

(Continued on page 53)

Charles E. Weller
IC

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Union RR

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EFFECTIVE...ECONOMICAL

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The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat up to 2500 sq. ft. without refilling—weighs a mere 6 lbs.

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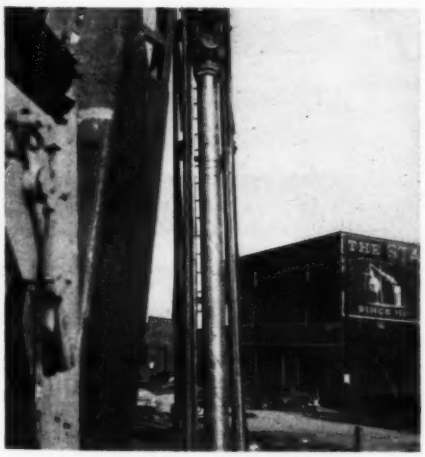

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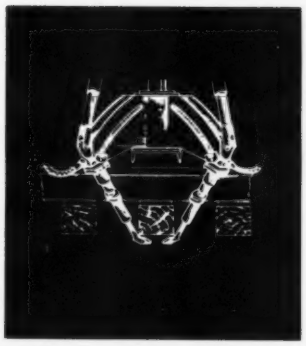
A SPOT TAMPER

A JACK TAMPER

With ballast compaction equal to the McWilliams Production Tamper, the machine tamps under the tie in sixteen positions—each tool tamping in two places. Speed in production tamping: up to 4 ties per minute. *As a Spot Tamper,* split head with integral jacks assures effective tamping of joints, low spots, switches and in yard and terminal work. *As a Combination Jack and Out-of-Face Tamper,* the machine will operate as a jack tamper in making out-of-face raises, finish tamping ties at jacking points. It then can go back and finish tamp the remaining ties —making possible out-of-face tamping with one machine, an operator and a foreman for sighting the raise. *Ask for details.*



Tools tamp in the same pattern as the McWilliams Production Tamper

Railway Maintenance Corporation

PITTSBURGH 30, PA.

Track Stays up Longer with a McWilliams Tamper

Railway TRACK and STRUCTURES

NEWS NOTES . . .

. . . a résumé of current events throughout the railroad world

Both houses of Congress have passed practically identical bills which will have the effect of increasing retirement benefits, financed jointly by the employees and the carriers, a flat 10 per cent. Unemployment benefits, financed solely by the railroads, will be boosted an average of 20 per cent. The bills, which have the active support of all railroad brotherhoods, will place an immediate additional burden of some $120,000,000 annually on the railroad industry. The final measure was signed into law by President Eisenhower on May 19.

All transportation unions should be made subject to anti-trust legislation and regulation. That proposal was made by Senator McClellan of Arkansas, chairman of the Senate's Special Investigating Committee, which has been probing into actions of the International Brotherhood of Teamsters. The proposal was given very little chance of being adopted by Congress because of opposition from the transport unions, including the railroad brotherhoods.

The railroads need to spend $14 billion for improvements during the next ten years, according to AAR president Daniel P. Loomis. To help the carriers obtain the money to pay for the improvements, Mr. Loomis called on Congress to (1) lower the maximum depreciable life of rolling stock to 15 years, of other property to 20 years, and (2) allow railroads to set up construction reserve funds out of their own income. His proposal included the recommendation that taxes on the earnings going into the reserve fund be deferred if the money is to be spent within five years for new facilities.

The Brotherhood of Locomotive Firemen and Enginemen in Canada has agreed to the elimination of firemen on diesel locomotives in yard and freight service on the Canadian National. Last year a similar agreement was reached on the Canadian Pacific. The agreement with the CNR, which follows the general outline of a settlement recommended by a conciliation board, came in time to avoid a strike scheduled to begin on May 1. Emphasis on elimination of firemen in diesels is now expected to shift to the United States where the union feels it is in a better position to meet the challenge successfully.

Applications have been filed with the Interstate Commerce Commission by the Santa Fe covering the relocation of 81 miles of line in Arizona. Two line changes are involved: (1) Construction of 44 miles of double track through a mountainous area on the transcontinental main line between Crookton and a point west of Williams, at a cost of $19,300,000; and (2) construction of 37 miles of single track in a valley location on the Phoenix line between Abra siding and Skull Valley at a cost of $2,900,000. Both improvements are designed to improve service and cut operating costs.

• This main-line track, left, of the Minneapolis and St. Louis Railroad at Hopkins, Minn., was treated with "Telvar" monuron and sodium chlorate-borate in June. Photo taken two months later. Note the excellent weed control compared to the track in center which was not treated.

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Du Pont "Telvar" monuron or "Karmex" diuron weed killers, used separately or in combination with other chemicals or weed oil, provide the base for efficient, economical weed-control programs. One application controls weeds for a season or longer . . . cuts annual maintenance costs. "Telvar" and "Karmex" weed killers are wettable powders, and are non-volatile, non-flammable, non-corrosive and low in toxicity to humans and livestock.

The selection of the proper Du Pont weed killer, "Telvar" or "Karmex", depends on various conditions of soil type and moisture. Du Pont Weed-Control Specialists are ready to aid you in choosing the proper chemical and in planning an efficient and economical weed-control program. Write: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Room D-4036, Wilmington 98, Delaware.

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Since 1909 the railroad industry has come to recognize the reliability and dependability of Fairmont products. In all seasons Fairmont equipment is at work helping the railroads do a better job of maintenance and inspection, and to save money in doing it. Our future is dependent upon the railroads, and we have faith in that future and in our ability to supply the machines that are needed in the extremely important field of railroad maintenance.

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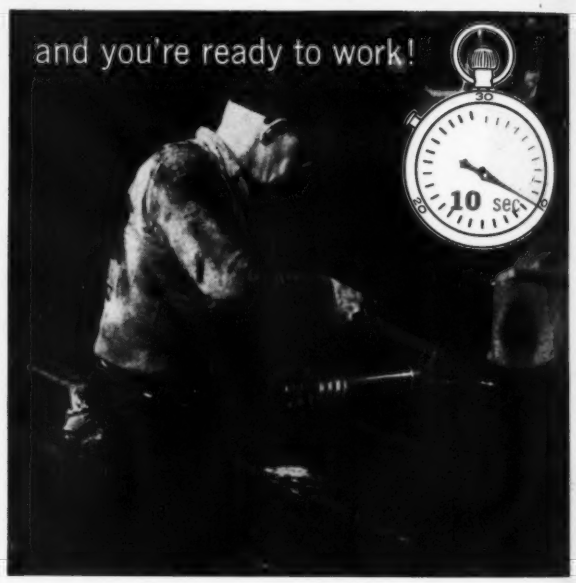

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RAILROAD PRODUCTS

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Who wants to work all year?

It wasn't so long ago that most railroads, this time of the year, were performing their heavy track work with large extra gangs in which muscle power was the main source of energy.

Because of mechanization these gangs have shrunk to a fraction of their former size, thereby greatly reducing the need for extra help during the working season. One result has been a profound effect on a way of life—that of the itinerant track worker. This individual, generally speaking, was an unattached, independent, restless person who had adopted a pattern of living that he considered entirely satisfactory.

His way of life followed an annual cycle which started in the spring with the opening of the working season on the track. During this season he toiled in an extra gang on the railroad of his choice. In the fall, when the work was done, he returned to the city (usually a large one), where, by living frugally on his summer earnings, he could maintain himself as a gentleman of leisure during the winter.

Those who lived their lives according to this pattern were, generally speaking, perfectly satisfied with their lot in life. Unburdened by responsibilities, and with their material needs reduced to a minimum, they had achieved a form of existence from which worry, tension and the ordinary problems of life were practically absent.

Mechanization has made a serious dent in this manner of living. Now there is a great deal of talk about stabilization of employment which, if achieved, would spell its end practically altogether. Has anyone thought to ask the itinerant track worker what he thinks of the stabilization of employment issue?

How a supervisor is rated at headquarters

The average supervisor out on the line wonders from time to time what "they" think of him back at headquarters. This is to be expected. His standing in the eyes of his superiors will determine whether he is in line for advancement or is destined to remain pretty much where he is.

Supervisors may well puzzle over this matter, for only rarely do they have more than a slight inkling of their standing in the minds of those who make the decisions when there are openings to be filled. A man may be criticized for fumbling a particular job or he may be commended for outstanding performance in a specific instance. But only rarely is he told that his overall performance is satisfactory or unsatisfactory and that he is, or is not, in line for advancement.

When he is thinking about this matter there are only two things a supervisor knows with certainty: (1) That his performance is under more or less constant observation; and (2) that his abilities have been rated and his qualifications for advancement catalogued, at least tentatively.

A supervisor may not have any way of knowing precisely how he rates with his superiors, but from experience and observation he should have a pretty good idea of the qualifications that are given the greatest weight when they are selecting a man for promotion. On this basis he would know that a man's over-all rating is largely determined by the answers to a number of questions such as:

How much initiative does he have? Supervisors may sometimes feel they are hemmed in and hampered by standards and regulations, but even so there is still a large area in which they are free to use their own judgment and to act accordingly.

Is he a good administrator? In other words, how well does he plan and execute the work carried out by the forces under his supervision? This point is illustrated by a comment made recently by a top engineering officer when told that an out-of-face surfacing gang was losing valuable time because it was held up at each grade crossing. He was critical because the supervisor had not planned the job to the end that necessary work at highway crossings would be done in advance of the out-of-face gang.

How well does he know his field? Obviously, a man must have a broad and unquestioned knowledge of the technical aspects of his work if he expects to be considered for advancement.

How well does he get along with people? It is important that a supervisor have a good relationship with his superiors. On the other hand, if he is to win the cooperation of his subordinates, it is equally important that he have a good relationship with them also.

Is he loyal to his superiors and to the company? A supervisor who doesn't have the interests of his company at heart, and who isn't willing to fight for those interests, won't get very far regardless of his other qualifications.

These questions cover just about every important qualification needed by a supervisor to win advancement. And any supervisor who will objectively study these questions in relation to his own abilities and performance need no longer have serious doubts about his standing at headquarters.

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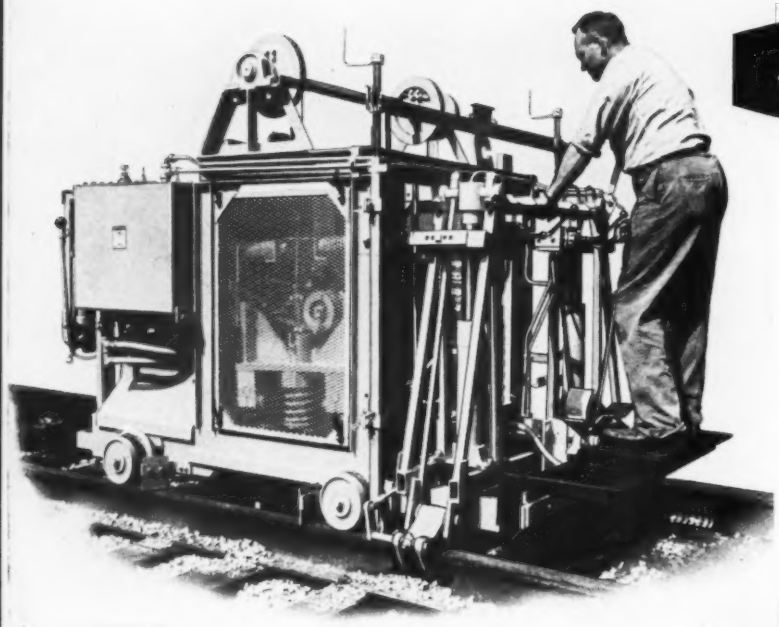
2 New-Improved *Mechanical Muscles*®



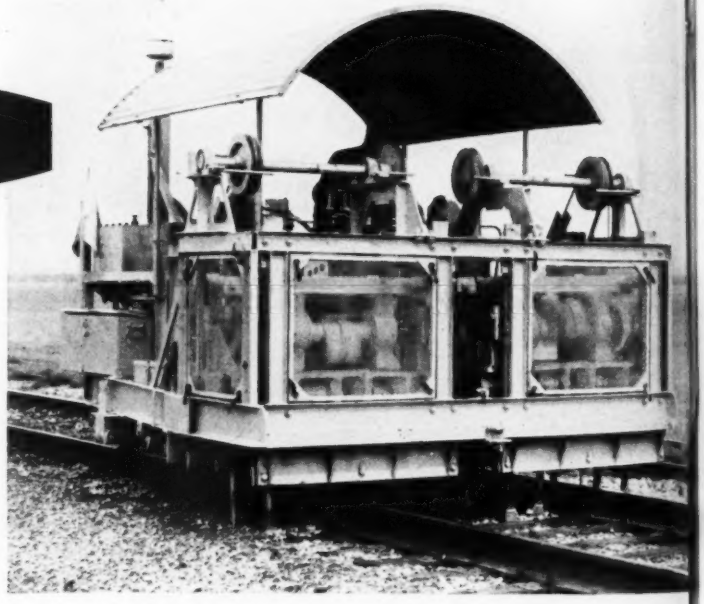
THE 1959 MODEL TAMPING POWER JACK

Incorporates four major improvements: (1) New Double Vibrator greatly reduces machine vibration, making cross-level bubble and pointers more stable when used in track raising or Smoothin' operations; (2) Improved, more uniform propulsion and positive braking; (3) Tamping bars easily kept in position by new spring arrangement; and (4) Ends of 2-piece tamping bars easily changed to meet needs for required lifts.

THE 1959 MODEL GANG TAMPER

Among the major improvements made to this 1959 machine is the completely new "Double Vibrator," employing two counter-rotating eccentric weights which increase the vertical vibration and impact of each tamping head and bar while eliminating horizontal vibration.

The speed with which the 2-piece tamping bars penetrate the crib ballast to get down to the tamping area under the ties has been increased because of the stronger action of the Double Vibrator and the added weight of each head. Larger volume hydraulic pumps speed raising of tamping heads. Faster penetration and faster lifting of heads thus increases tamping speed.



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On the B&O . . .

Mechanization—"Package" style

The track forces of the B&O are being reorganized and further mechanized with about $3½ million worth of equipment, all obtained under lease, which will provide complete mechanization of these forces.

An essential part of the plan is the reduction of the number of sections from a total of 852 to 199 and the establishment of highly mechanized extra gangs. For these gangs the road has put together outfits of work equipment in "package" form that are uniform in consist throughout the system.

Introduction of the new plan was featured by a high degree of cooperation between the railroad and the union, resulting in an agreement in which both parties express satisfaction.

● As this issue was coming from the presses a new arrangement of the track forces of the Baltimore & Ohio was nearing completion.

In what amounts to a single broad stroke these forces are being mechanized on a systemwide basis. Directly tied in with the mechanization program is a sweeping reorganization of the forces to take full advantage of mechanization.

The scope of the program is illustrated by the fact that, in putting it into effect, the railroad acquired a total of $3½ million worth of equipment, all of which was obtained on a rental basis through Morrison Plan, Inc. The lease agreement covers a total of 1,350 pieces of equipment, including 425 units of track equipment and machinery, 516 units of automotive equipment and 409 units of truck accessories, such as bodies, winches, hoists and flanged-wheel attachments.

Sets up 'pilot program'

Since the existing arrangement of track gangs on the B&O was not readily adaptable to mechanization, it was apparent that some type of force rearrangement was necessary so that machines could be used to best advantage. To this end a study was made of the Baltimore East End Division which extends from Philadelphia, Pa., to Washington, D.C., and includes a number of branch lines. The miles of track on this division totals 458.

In June, 1958, as a result of negotiations between the Brotherhood of Maintenance of Way Employees and the railroad, a 'pilot program' on reassignment of track forces went into effect on this division. The pilot program consisted of substituting 10 section gangs and 9 extra gangs for 37 section gangs and four extra gangs. The division was equipped with the necessary machines and their operations were studied for several months.

From the experience gained on this division a desirable force rearrangement plan was set up for the remainder of the railroad and details of the equipment necessary to mechanize all units were developed.

New agreement with union

Negotiations were then initiated with the Brotherhood. These negotiations were recently concluded and a new agreement covering the rearrangement of track forces has been entered

Some of the B&O's new equipment is shown here in use behind a Mannix undertrack plow. The units include two tie spacers and (in the background) a Tie Handler. A total of 1,350 units of equipment was acquired under a lease agreement.

Mechanization—"Package" style (cont'd)

into between the Brotherhood and the railroad.

The B&O has 17 maintenance divisions and 69 supervisors' districts. Under the new agreement the present division and subdivision limits were not changed but the sections were reduced in number from 852 to 199. On the other hand the number of extra gangs will be increased from about 81 to 204. The new agreement is in process of implementation and it will be in effect on the entire railroad by June 16.

The modernization plan places all out-of-face track work in the hands of small mechanized extra gangs. Formerly, about half of all such work was handled by the section forces. These forces will now handle only a small amount of this work and their primary duty is to inspect track and make what minor repairs they can. The bulk of the track work, including tie renewals, rail laying, raising and surfacing track and spot surfacing, will be done by well-mechanized extra gangs, working separately or collectively. These gangs will be assigned to work on a supervisor's territory. There will be no system track gangs.

Men for the small extra gangs were obtained by lengthening the sections. The main-track sections will now average from 50 to 60 miles in length and the light branch-line and yard sections will average from 60 to 100 miles each. The yard sections are manned by a foreman and two trackmen, all others by a foreman and one trackman.

Each supervisor will have two or three of the mechanized extra gangs, each comprised of a foreman and 7 to 10 men, depending on the type of work to be performed.

Trucks give mobility

Mobility was given to the track forces by furnishing each gang with a truck. All section gangs, with the exception of 31 on light-branch-line sections, were each assigned a 1-ton panel truck. The sections on the light-branch-line sections were each assigned a ½-ton pickup truck having a flanged-wheel attachment.

Each of the extra gangs has a 2½-ton stake-body truck. The trucks assigned to gangs working in major yard areas are each equipped with a 4,000-lb Daybrook hoist. Each supervisor was assigned a ½-ton pickup truck equipped with a flanged-wheel attachment. At least one of the 2½-ton trucks assigned to the extra gangs under each supervisor is equipped with a 4-ton Braden hoist.

In addition, there are 4 dump-body trucks and 15 mechanic's trucks for use by a corps of field mechanics employed to maintain the equipment. The dump-body trucks were required to work as a unit in connection with ballast reclamation necessitated by a track-removal project in CTC territory. The mechanics' trucks are 1-ton dual-wheel units with special compartment-type bodies. They each carry a small air compressor for powering air tools and for inflating tires.

Trucks all of one make

The entire program required 100—½-ton pickup trucks, 168—1-ton panel trucks, 204—2½-ton stake-body trucks, 4 dump-body trucks and 15 compartment-type trucks, as well as the hoists, winches and flanged-wheel attachments installed on them. The rail-wheel attachments are manually operated and are of the Hy-Rail or Rail-Road type. They were mounted on the trucks at the railroad's Rossford shop near Toledo, Ohio. The trucks are all of one manufacture so as to save on maintenance and to reduce the necessary stock of engines and parts.

Most of the other track equipment acquired is assigned as "package" units or outfits. For example, each division is assigned a set of equipment units required for laying rail and another set for making tie renewals and surfacing track. In addition, each supervisor of road is furnished with a set of commonly used machines, and these are sometimes used to augment the rail-laying machine package. The machines assigned to each supervisor include a power rail drill, rail saw, bolting machine and hydraulic track liner.

A typical package of rail-laying equipment, of which the B&O will have 22 sets, consists of the following:

- 2 Tie adzers
- 2 Power wrenches plus supervisor's units
- 2 Spike pullers
- 1 Creosote applicator
- 1 Pregager
- 1 Gager
- 1 Rail Layer
- 2 Spike hammers
- 1 Utility crane
- 1 Bit grinder

To use this equipment efficiently when laying rail, all three of a supervisor's small extra gangs will be bunched together to provide sufficient force to do this work. Rail is laid throughout the year as it is received and allotted.

It is the B&O's policy to surface the track and to make necessary tie renewals wherever new rail is laid. The new set-up includes a package of equipment for doing this work. The road will have 21 sets of this equipment, each consisting of the following:

TRUCKS destined for the B&O were made at the GMC Truck & Coach Division's plant at Pontiac, Mich. This view, taken last winter, shows them prior to shipping.

1 Hydraulic spike puller
1 Rail lifter
1 Tie extruder
1 Tie-bed scarifier
1 Tie inserter
1 Spike driver or spike-nipper, depending on the number of ties
1 Tie spacer
1 Ballast Regulator
1 Production tamper
1 Track liner

To obtain a force of the proper size to work this equipment, two or three of the supervisor's gangs will be joined into a single unit.

For its spot-tamping work, the B&O obtained 10 sets of equipment. Each set consists of a spot tamper and a track liner. These are shifted around as required.

With this distribution of men and equipment, the B&O feels that it now has a hard-hitting track force which will produce more work at lower unit costs.

To explain the new working equipment to all track forces a series of meetings was held throughout the system with representatives of the Brotherhood and management presiding. It was considered important for the men to have a clear understanding of the changes taking place. Bulletins have been issued abolishing all positions under the old system and advertising those available under the new set up. In this way, the men are given an opportunity to express a preference as to the jobs they will fill in the future, and positions are awarded on the basis of seniority.

What they say about the new agreement

Both the B&O and the union are apparently pleased with the new agreement that was consummated in conjunction with the mechanization program described in this article.

An article in the May issue of the Baltimore & Ohio Magazine, describing the program, includes comments by W. N. Clay, the BMWE's general chairman on the road, and C. R. Riley, chief engineer of the B&O.
Said Mr. Clay:

"This agreement represents a sincere desire on the part of the brotherhood and the management to resolve a mutual problem. The interest of management and the welfare of the employees have received very careful consideration. We have recognized that the transition in maintenance work method that flows from mechanization must be met and disposed of prior to the date the change actually takes effect.

"Furthermore, this agreement affords protection for maintenance-of-way employees who have spent their working lives in the service of the Baltimore & Ohio. It places a realistic floor under the number of track crews that are to be employed in the mechanized operation, thus promoting stability of employment. It preserves to a major degree the take-home pay of foremen whose status may have been changed as a result of the mechanization operation. It protects the prior seniority rights of all maintenance-of-way employees. It standardizes rates of pay and provides for increase in rates for employees whose duties and responsibilities are increased.

"In brief, it is a good agreement arrived at in an atmosphere of confidence and good will."
Said Mr. Riley:

"We are naturally gratified that full mechanization of our track forces will shortly be accomplished. We regard this as a milestone in the B&O's effort to equip itself for railroading in a new day and age. In effecting the necessary modernization, we have tried to do so with full consideration of the men who make up our M of W forces, and shall continue to do so. The new agreement providing for rearrangement of these employees was entered into in good faith by both labor and management, and I should like to take this opportunity publicly to express our appreciation to the Brotherhood of Maintenance of Way Employees and its leaders for the understanding and cooperation which they showed throughout our negotiations."

MACHINES shown here comprise part of one of the B&O's "package" units for renewing ties and surfacing track. Beginning in the foreground the machines are a spiker-nipper, a track liner, a Ballast Regulator and a production tamper.

How the Clinchfield . . .

. . . Removes foul ballast from tunnels

By J. M. Salmon, Jr.
Chief Engineer
Clinchfield

[In his search for an effective and economical method of removing fouled ballast from tunnels, Mr. Salmon asked this magazine if it could help find a solution to the problem. When the question was raised in our "What's the Answer?" department two answers were submitted, which were published in the February 1959 issue. Meanwhile the author continued his own efforts to solve the problem. With his costs now lowered to a reasonable figure he has submitted the accompanying description of the equipment and methods he is presently using.—Editor.]

● The problem of removing fouled ballast from tunnels will always be present and the answers will probably be many and varied. The first such work we performed was in our Tunnel No. 29. It was here that we learned many things about undercutting and loading operations.

For removing the old ballast in tunnels we use the Kershaw Undercutter. In attempting to make our first undercut, it was soon apparent that, to obtain a uniform travel speed and a near constant chain load, it would be necessary first to remove the ballast from the cribs. It was also found that the ballast in some cribs did not fall soon enough to be removed by the machine's chain. As a result, it fell behind the undercutter and, as the track lowered onto the newly cut bed, the fallen crib material had to be smoothed before the ties settled on it or we had uneven track.

To overcome this, four track laborers, using two company-owned Kershaw Kribbers, were employed to remove the crib ballast between the rails and at the tie ends. The machines were used in tandem to cut from the center of the track to one side, then turned to cut from the center of the track to the opposite side. This operation removed all the crib ballast except that portion under the rails. It was found that this improved the undercutting operation as it produced a nearly uniform amount of material for the chain to handle.

Two other problems

At this point we ran into two other problems. One was a cocking of the ties on one side as they settled behind the undercutter. This was the result of inadequate room along the wall for the material piled up by the undercutter. The other was the effect on the undercutting operation of the shoulder ballast.

Here's the situation that produced these problems:

All of the tunnels are single track and the side walls are a minimum of 8 ft and a maximum of 10 ft from the center line of track. Some tunnels are concrete lined and some unlined rock. In the lined tunnels, where side clearances are 8 ft from the track center line and water is present, the cut material had a tendency to slump and run back under the tie ends on the side to which the undercutter was delivering. As a result, the ties were held off the newly cut bed and at poor cross level.

It was also found that the bottom sprocket of the cutter chain, as it advanced against the shoulder of the material near the end of the tie, caused the material to flow around the sprocket on the chain-discharge side and to fill and wedge between the chain and sprocket. This produced excess wear on the sprocket and, if the material being excavated was larger than that passing a 1½-in screen, caused chain breakage.

To avoid cocking of the ties and unnecessary repair expense and delay to the undercutter, we ran a company-owned Jordan spreader over this track ahead of the undercutting operation. The front ballast plow of this machine was altered by bolting a curved and braced blade extension to the bottom of the plow blade. This cut away the material on each side of the track to a depth of 6 in below the bottom of the ties and plowed it away from the tie ends to the tunnel walls.

As a result, a considerable volume of material piled up along the side walls. Before operating the undercutter, this material was picked up, de-

The Clinchfield has an average of one tunnel for every five miles of main track. The shoulder and undertrack ballast has become fouled in many of them and, through repeated surfacings, the overhead tunnel clearances also were becoming restricted. In replacing this ballast and lowering the track, the road devised a method of picking up, loading and removing the old ballast under traffic at a cost of $5.07 per cu yd.

posited in a 30-cu yd air-dump car and taken out of the tunnel to the point of dumping.

New loader was used

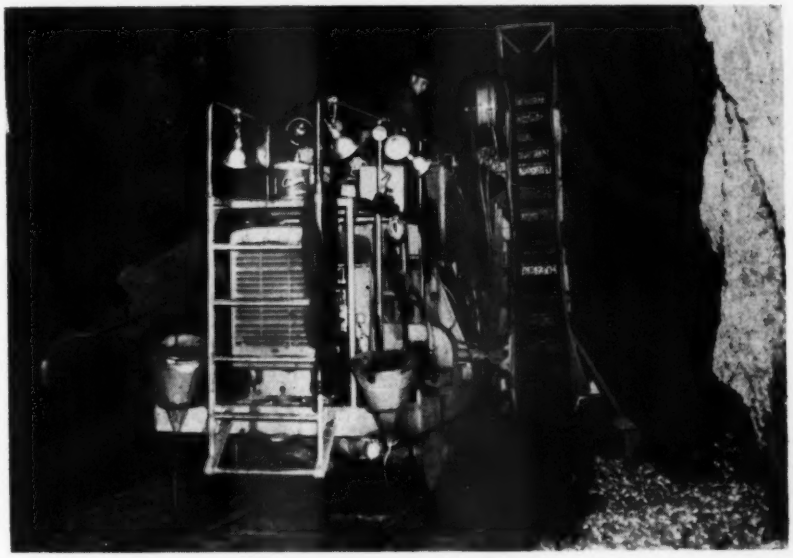
The machine which we used to pick up and load the old ballast was a special adaptation of the Kershaw ballast cleaner. This machine had a scoop and a bucket-type elevator on each side. A spiral feeder in each scoop kept the material moving toward the buckets. The buckets emptied into chutes which dropped the material onto a long conveyor belt. The latter was rail-mounted with its own driving motor on a four-wheel carriage frame which was constructed so as to pivot for negotiating curves and turnouts. It was towed behind the loader. The conveyor belt was long enough so it could fully load, over one end, a Magor 30-cu yd side-dump car.

The loader is self-propelled and was operated by two section laborers. One man controlled the travel of the machine as well as the position of one scoop. The other man controlled the scoop on the opposite side.

The 30-cu yd dump car was handled by a Burro crane. The operator of the crane kept the car in proper position for loading. When it was filled, the operator signaled the loader operators to stop loading, after which the Burro machine hauled the dump car outside of the tunnel where the materials were wasted.

Wasting of materials

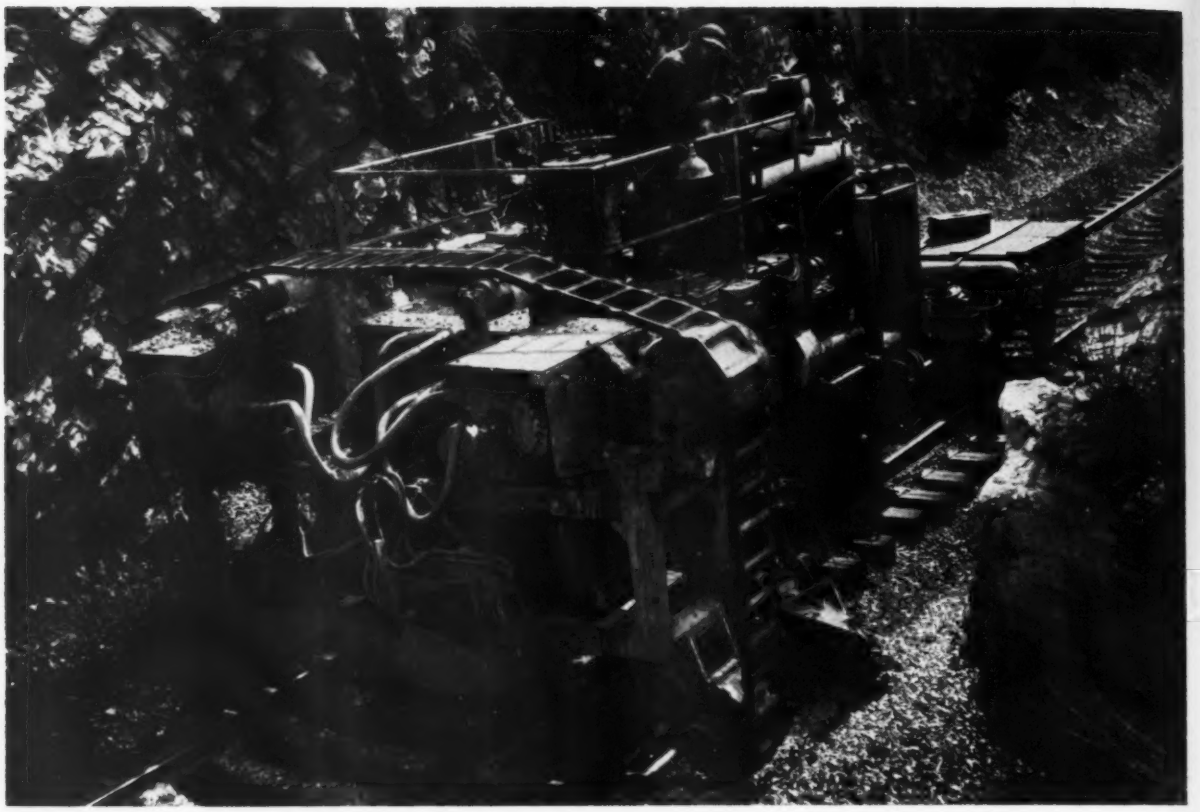
Fortunately, all dumping locations were accessible to highways. The wasted material was comprised of ballast, water, fly ash and dirt, which made it a very good water-bound road surfacer. Arrangements were made with the State Highway department for its personnel to use their own end loader for loading the material into their trucks for use on secondary roads. This permitted us to dump at one location and did not require us to use a work



▲ **PICK UP**

▼ **LOADING**

BEFORE any undercutting was done, it was necessary to remove the crib ballast with two Kershaw Kribbers and to cut down the shoulder ballast with a Jordan spreader. This operation piled the old foul material against the tunnel walls. A machine, adapted from the Kershaw Ballast Cleaner, was used to scoop up, elevate and drop the foul material onto a long belt conveyor. The latter had its own driving motors but was towed by the loader. The conveyor belt was long enough so it could fully end load a 30-cu yd air-dump car which was hauled by a Burro crane.



Removing ballast from tunnels (cont'd)

train for spreading the waste material.

The undercutting followed the loader. A section laborer was used to operate this machine. We found that the minimum cut possible was 4½ in and the maximum about 6½ in. The greater the cut the slower the speed of travel and, we believe, the greater the incidence of chain breakage. A cut of about 6 in for the first pass worked most efficiently. We found the subgrade so compacted below this level that subsequent cuts were reduced to 4½ in.

Two section laborers followed the machine on the ground. They were used to place run-off planks at the beginning and end of the undercutting for the passage of trains. Train speeds were reduced to 10 mph. These men also uncoupled the chain for the removal of the undercutter, and recoupled the chain as necessary. A section of the chain was left in place under the track when passing trains and when not in use. In addition, these men tightened spikes on any ties which had a tendency to fall from the rails, and cut materials away from the ends of the undercut ties in cases where the presence of water had caused the material to slump and flow back under the tie ends.

All track which was to be undercut had anchors placed on each side of each tie on both rails by sectionmen prior to any work, including the cribbing. It was found that, even with the double-shoulder tie plates, any spikes which permitted a tie to drop the depth of the tie-plate shoulder also permitted the tie to slew. Hence, when the track dropped to rest on the undercut bed, the rail would ride the plate shoulders and not reseat itself.

After the first cut was started, the loader had no trouble in keeping up with the undercutter. After one pass was completed, a work train was again used to push the Jordan spreader over the work to plow out the material below the tie ends. This operation was accomplished in two passes, each at a speed of about 3 mph. Other work was found in the near vicinity for the regularly assigned ditcher work train so that excessive traveling time and costs, or extra crew and work-train costs, were avoided.

An assistant equipment maintainer was assigned to this work. He was equipped with a Chevrolet four-wheel-drive, ½-ton truck with oxyacetylene burning and welding equipment, a 250-amp portable arc welder-generator combination, a full complement of tools, and a combination living car—work shop.

The assistant equipment maintainer began work one hour prior to the assigned force when undercutting and loading and he completed his work one hour after the remainder of the force had quit. This permitted lubricating and fueling all equipment without delaying the work. It was found that the loader-conveyor required very little adjustment. Proper lubrication and keeping a close check on the chain tension of the bucket conveyor and the belt tension for the belt conveyor were the major items requiring attention.

The sprockets and chain of the undercutter required considerable attention. The sprockets must be changed out and rebuilt by welding when excessive wear occurs. Badly worn cutter-chain sprockets cause early chain wear and may result in frequent breakage. For this reason, the chain links and chain pins must be replaced as excessive wear occurs.

ADEQUATE ROOM for the undercut material was a problem. This was solved by operating the loader and belt conveyor.

SECTION of cutter chain was left in place under the track (above) when passing trains or when not in use. Run-off planks were placed at beginning and end of undercutting (below).

◀ CUTTING DEPTH of the Kershaw Undercutter was varied between 4½ and 6½ in. On the first pass, a cut of 6 in worked out best. Cuts of subsequent passes were reduced to 4½ in.

The master links and pins which permit uncoupling the chain must be kept in good repair. We found that breakage could be controlled by stopping the undercutting work at regular intervals and checking the cotter keys in the two master pins. As these wear they must be replaced or chain breakage will occur. Two chains were kept on hand. When one began to show excessive wear at any point, it was replaced and reworked out of the tunnel for reuse at the next changeout.

We found the cutter bits which we first used on the chain had a costly wearing surface—silver soldered to the bit. We believe the standard cutter bits used in coal mining, which were readily available on our line, are more economical than the built-up cutter bits. There was little breakage and, when wear required, replacment of the bits was easily and quickly made.

A cost study was made of the work performed at Tunnel No. 55 (see box). The total amount of material handled was 3,067 cu yd. The out-of-pocket cost (no rental charge made for the use of company owned equipment) was $5.07 per cu yd. The 3,180 ft of track undercut resulted in the equivalent of 8,619 track-feet undercut one pass. The cost per foot of single track completely undercut was $4.90 and the cost per track-foot per single undercut was $1.81.

In my opinion, the cost per cubic yard of materials removed is the better index. The depth of undercut varied from 4½ in to 28 in. A close estimate can be easily made of the total amount of materials to be removed and a cost index for this yardage would then give a fair estimate of the cost of the project.

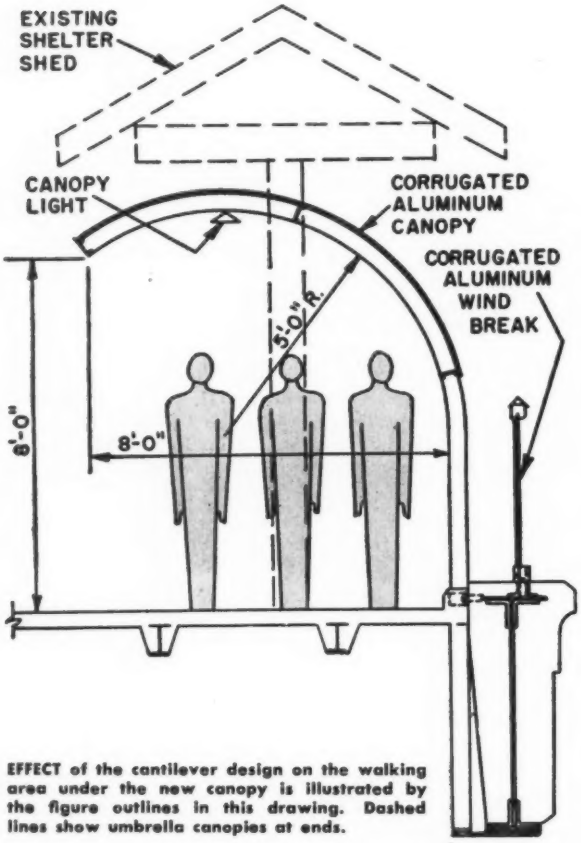
Cost of ballast removal from 3,180 ft of track at tunnel No. 55

† Work train, including wrecker, section foreman, four section laborers and two assistant equipment maintainers in unloading and setting up the undercutter and loader	$ 685
Section foreman and 6 laborers applying rail anchors	291
Section foreman and 6 laborers (2 flagging) cribbing track	730
Assistant track supervisor	414
Assistant equipment maintainer	413
Conductor and 2 trainmen, flagging	1,060
Section foreman and 5 laborers, undercutting and loading	1,953
Burro crane operator handling dump car	286
Work train, including crew, Jordan spreader, plowing material from tie ends	1,307
* Repairs, including cutter bits, fuel, lubricants, etc.	1,098
* Rental of Kershaw equipment	5,850
* Proportion of foreign line freight, Montgomery, Ala., to line and return	532
† Work train, including wrecker, etc., loading undercutter and loader	750
Section foreman and 6 men removing anchors after track surfaced	200
Total	$15,569

* These items were proportioned by multiplying total item expense by number of days on this tunnel and dividing by total days of rental

† This item is high compared to same work performed at Tunnels No. 26, 27, 28 and 29. Work performed at Tunnel No. 55 where 3,180 ft of track was undercut required the same loading and unloading as did work at Tunnels 26 through 29 where 10,250 ft of track was undercut.

COLUMNS consist of steel I-beams which are spaced 8 ft apart. Purlins complete the framing. They consist of small steel channels and are set flush with the outside flange of the columns. Total length of the new canopy is about 330 ft.



EFFECT of the cantilever design on the walking area under the new canopy is illustrated by the figure outlines in this drawing. Dashed lines show umbrella canopies at ends.

For passenger platforms . . .

A curved aluminum canopy

The Jersey Central has come up with something new in the way of shelters for passenger platforms. It's a cantilevered canopy covered with curved aluminum sheets. Windbreaks of similar material add to passenger comfort.

● Curved corrugated aluminum sheets form a modern, functional, and practically maintenance-free, canopy over the passenger platforms of the Jersey Central's passenger station at Elizabethport, N. J. The sheets are fastened to a curved steel frame that cantilevers over the platforms. Since the supporting columns are all located at the rear of the platforms, passengers are afforded a clear walking area while at the same time being protected from the elements.

The new canopies were installed to provide protection for passengers moving between two Jersey Central platforms at Elizabethport. Here, in brief, is the situation:

The road's passenger station at this point is located at street level near the junction of two lines, the Newark & Elizabeth branch and the Long Branch Wye. Both lines are elevated here on embankments and are carried across Trumbull Street at this point on underpass structures in which the main supporting members consist of steel girders encased in concrete.

In addition to the main station at ground level each of the two lines is served by an enclosed waiting room at track level. The platforms immediately adjacent to each of these waiting rooms are protected by canopies of the umbrella type. For the convenience of passengers who wish to move from one of the platforms to the other there is a connecting walkway extending between them at track level. At its opposite ends this walkway is carried across Trumbull Street on the underpass structures, and these portions are joined by a connecting leg supported on a fill behind a retaining wall that extends between the abutments of the two bridges.

The new canopy, which is approximately 330 ft long, extends the length of the connecting walkway between the existing canopies at the waiting rooms. Because it

NEW CANOPY protects passengers moving between platforms serving the Long Branch Wye (left) and the Newark & Elizabeth branch (right). Both platforms are carried across Trumbull St. on overpass structures.

would have been expensive to anchor the columns on the bridge if they had been centrally located in the walkway, the columns were located to one side permitting them to be anchored into the facia girder of each bridge.

The supporting columns are 6B12 sections and are spaced 8 ft apart. The top portion of each column is curved to a radius of 5 ft from a point of tangency that is about 4 ft above the top of the platform.

The corrugated roofing, of 20-gage aluminum, was applied to the steel frame by means of self-tapping screws. Side laps were fastened with aluminum sheet metal screws. Screws of both types were fitted with composite aluminum and neoprene washers. All steel that was to come into contact with aluminum was coated with a heavy-bodied bituminous paint to prevent electrolytic action between the two metals.

As part of this project a windbreak was provided behind the canopy. It consists of flat sheets of corrugated aluminum fastened to an existing metal fence.

The structural steel and corrugated aluminum roofing for the canopy and windbreaks were fabricated and furnished under contract. The design and construction of the canopy was carried out by the railroad under the direction of B. J. Minetti, chief engineer.

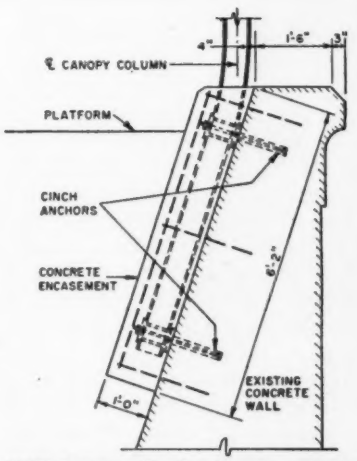
Three types of supports were required

An interesting aspect of the project was that three different types of supports had to be provided for the canopy columns, depending on their location. The different locations and the type of column support designed for use at each of them are as follows:

(1) **In the fill behind the abutments.** Here the columns are each supported on a reinforced concrete footing.

(2) **Behind the retaining wall connecting the bridge abutments.** The lower end of each column in this location was bent to lie along the back side of the retaining wall and is attached to it by means of bolts and cinch anchors. This end was then encased in concrete.

(3) **On the bridges.** The columns here are located immediately inside the main outside girder of the bridge. These columns were each inserted through a square hole in the platform slab and the lower end welded to a 1-in plate welded to the under side of the bottom flange of the girder. A strap was then fitted over the column near the top flange of the girder and fastened in place by two bolts and cinch anchors inserted into the concrete encasing the girder. The hole in the slab was filled with non-shrink grout.



HOW lower ends of columns were attached to back face of retaining wall.

CRANE, in background, lifts rails from stock pile and places them on semi-automatic feeding ramp at left. Ramp delivers rails to production line by push-button control.

Now—A fixed plant for

A new rail butt-welding service has been made available at Chicago. It's in the form of a commercial stationary plant that has been set up to produce welded rail on a cost-per-weld basis.

● About the middle of May, the first string of continuous welded rail to be commercially welded in North America at a fixed-plant location came off the production line. This was a continuous length, ¼ mile long, of 119-lb CF&I rail for the Chicago, Rock Island & Pacific. It was welded at a new plant located at Summit, Ill., in the Chicago Switching District. The plant was built and will be operated by Matisa Railweld, Inc., an affiliate of the Matisa Equipment Corporation.

Up to the present time, any railroad wanting continuous welded rail had the choice of leasing welding equipment, of buying welding equipment outright, or of making special arrangements with another railroad which had such equipment available. With the opening of the new plant at Summit, another option has been made available—that of having rail welded on a cost-per-weld basis at a commercial fixed plant so located that it is in a position to serve various roads. This is the way it works:

The railroad ships its new or usable rail to the plant at Summit. The plant welds the rails into the desired lengths and loads them onto special flat cars furnished by the road. The loaded cars are switched from the plant by the Indiana Harbor Belt to the owning road's connection within the Switching District. There is said to be no difficulty about interchange because the rail-owning road will accept its own loaded cars.

"Under our plan," said Robert P. Underwood, vice-president and general manager of Matisa Railweld, "the railroad is relieved of responsibilities in connection with labor, supervision and operation."

The Summit plant is located on 59th Street near Archer Avenue. Facilities include an incoming rail track 800 ft long, a rail storage area, a line of elevated roller-bearing rollers for handling the rail through the production line, an Armco prefabricated building 50 ft wide by 200 ft long, and two loading tracks. The building houses the welding, grinding and inspection equipment, and also contains offices and wash-and-locker facilities for employees.

When the customer's rail arrives at the plant, it is removed from the cars by a Coles 15-ton crane. When possible, the rail is transferred directly from the cars to a semi-automatic rail-feeding ramp; otherwise the rail is stock-piled until it is to be processed. The ramp is loaded with 40 rails at a time. A man, stationed between the ramp and the building, actuates a push button to cause the ramp to place a rail on the production line. The man at this station also cleans the rail ends and lightly polishes the ball of the rail where the welding electrodes will soon make contact. The rail is then pushed into the main building toward the welding station.

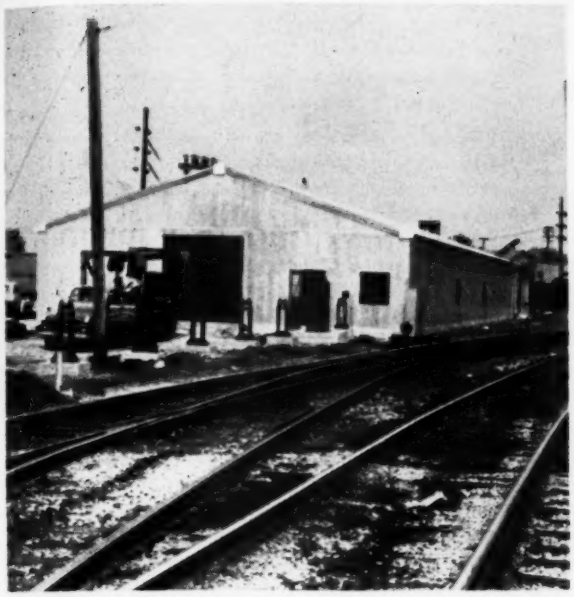
Electric-flash welder

The welding machine is of the electric-flash type and was furnished by A-I Welders, Ltd., Inverness, Scotland. Originally ordered by the Rock Island the machine is operated by Matisa Railweld, Inc., under a long term lease from the railroad. "The entire project," said Mr. Underwood, "was made possible through the far-sighted cooperation of the Rock Island management."

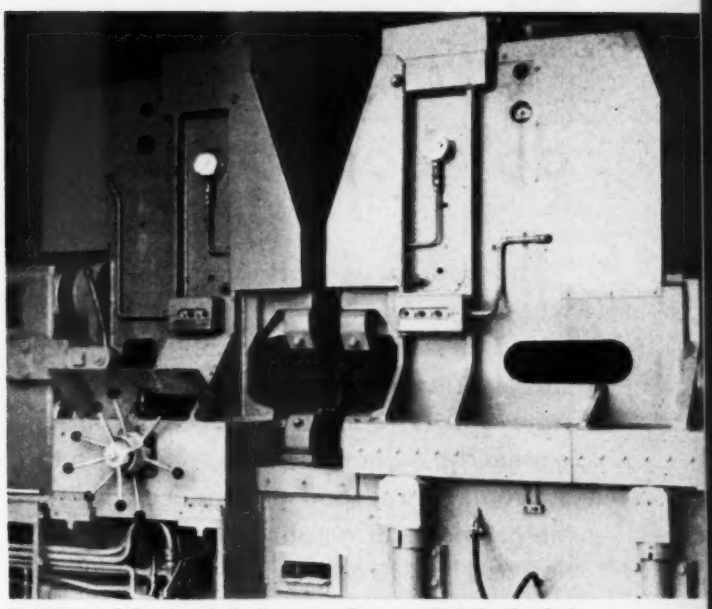
The welder is the latest model manufactured by A-I and has more clamping pressure than previous machines, according to Mr. Underwood. The electrodes, he said, engage the rails at a pressure of 120 tons and the rail ends are forced together at a pressure of 60 tons. This compares with 100 tons and 50 tons, respectively, for previous models.

The machine is capable of producing an average of 20 welds per hour, according to the manufacturer. With the plant working three shifts daily Mr. Underwood estimates the output will range up to approximately 400 welds per day.

A feature of this welding installation is the provision of two rail-lining devices at each end of the welder. These are air-operated and enable the rails to be butted together in the proper alinement. When the rail ends have been lined correctly the welder operator pushes the buttons to start the welding cycle. From this point the



WELDING, grinding and inspection equipment, as well as offices and facilities for employees, are located in prefab building.



WELDER is of the electric-flash type and was made in Scotland. It is operated under a long-term lease from the Rock Island.

butt-welding rails

welding process takes place automatically.

Beyond the welding station on the production line there are two grinding stations. Although the first is ordinarily positioned 39 ft from the welder and from the second grinding station, these units are mounted on flanged wheels and can be moved along a track embedded in the floor for handling short rails or 78-ft rails.

At the first grinding station, operated by one man, the upset metal is removed from the underside of the rail base, from the edges and top of the rail base, and from the web on both sides. At the next grinding station, the upset metal is ground off the sides and top of the ball.

The next operation, inspection of the welds, is performed by a man using a Sonoflux magnetic inspection unit. This man is also equipped with a small hand grinder for removing any imperfections that may be left by the grinding stations.

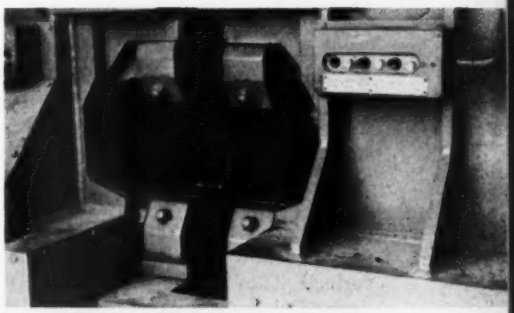
Beyond the inspection station in the building is located a winch with a rail grab, for moving the long welded rails out of the building onto the car-loading ramp and onto the cars. It will remove the rail 39 ft at each grab.

The production line continues straight for the first 100 ft outside the building. From this point, it diverges into two lines so rails can be loaded on cars standing on either of the loading tracks. It is the intention to load the rail on cars in three tiers of 12 rails each. This type of loading will come the closest to giving the minimum carload rate of 60,000 lb.

The plant will be operated by 10 men in each 8-hr shift. Four men will be used on production work, one on inspection, and five others for stock piling, loading and unloading rail, and maintenance.

"We can weld any rail up to and including the 155-lb section," said Mr. Underwood. Pointing to several high stock piles of new rail, he said: "There's over 70 cars of rail piled there. We already have commitments from the Rock Island, the Pennsylvania and the New York Central. We also expect to have a rail-cropping plant operating by the end of the year. We can then crop and weld usable rail."

Charles W. Plunkett, recently appointed operations manager of Matisa Railweld, Inc., supervised the construction of the new plant. Parker Hills, who has been with Matisa as welding engineer for the past four years, will serve as welding superintendent.



RAIL ENDS in welding machine are alined by air-operated devices on both sides.

UPSET metal at welds is removed by two grinding stations carried on track in floor.

What can you do about scour?

The beds of most streams in the southwestern region of the United States are composed of sand and gravel. During flood stages, this material approaches a fluid state and is readily displaced by moving water. The author delves into his more than 50 years of railroad experience to discuss the problems originating from scouring action and how to cope with them.

By **Joseph A. Noble**
Chief Engineer (Retired)
Western Lines, Santa Fe

● There is a Scottish and Italian proverb to the effect that "if you can't see the bottom you should not cross the river." This is a pretty good rule to follow in the southwestern part of the United States if the water is running.

The reason is that most streams in that part of the country have beds composed of sand and gravel and you can't tell how deep they are by the height of the water surface. They might be bank full today and three feet deep, then look about the same tomorrow and be nine feet or more deep.

This phenomenon, of course, is caused by lowering of the streambed by scour. This has implications of interest to anyone concerned with the design or maintenance of bridge foundations or with the protection of banks on streams of this type.

The writer recalls one case on the Pecos river near Roswell, N. M., where some channel bents of a pile trestle, having a penetration of 40 ft below the normal bed of the river, were washed out by an 8-ft rise. A considerable amount of drift, mostly cottonwood trees, lodged against the bridge. It was shoved out of line and several bents were swept out from under the bridge. The damming effect of the drift was probably the chief cause of the deep scour in this case.

An occurrence of this sort might be avoided by rebuilding the structure with spans long enough to pass the drift. However, there are many locations, as on light-traffic branch lines, where this expedient could not be justified on account of the cost.

Under such circumstances some stability may be given the bridge by driving steel rails alongside the batter piles into the shale or rock, and anchoring the batter piles to them. The rails can be driven by a pile driver and will penetrate very hard material to a depth, say 3 or 4 ft, sufficient for the purpose. The possibilities can be determined by driving two or three test rails.

Eight ways of preventing trouble

Based on many years of experience with the effects of scour and bank erosion in southwestern streams the author offers these suggestions for overcoming or preventing the problems caused by them:

(1) In new bridge construction when economically justified use spans long enough to pass the expected drift, and support them on piers bottomed several feet in hard material.

(2) If so-called permanent-type construction cannot be justified and a pile trestle is used, try to get some penetration in hard material by the use of pile points or, failing this, drive T-rails along the batter piles for anchors.

(3) Existing bridges with piles resting on a hard stratum can in many cases be strengthened against scour

In some cases riprap dumped around the piles may stiffen the bridge but the writer would hesitate to use this method except possibly for pile-trestle approaches to long-span bridges. He believes anchoring the bents as previously described would usually be cheaper and more satisfactory.

If the cost can be justified the best way to dispose of the drift problem is by replacing the pile bridge or a portion of it with longer spans on piers. Under the conditions assumed in this article probably the most economical type structure would consist of beam spans on steel pile piers, provided, of course, such piles could be driven a few feet into the hard stratum. This can be determined by driving two or three test piles. If steel piles won't penetrate the rock, concrete piers would probably be used and then longer spans might be preferable.

A not uncommon situation in southwestern streams is for a bed of sand and gravel, 20 ft to 25 ft thick, to overlie shale or rock. Pile trestles in locations of this kind usually are not saistfactory structures, unless the bottom of the piles can be fixed in the hard stratum, as in high rises the streambed will likely be fluid to the rock.

In many, if not most, cases it will not be possible to drive wood piles into the shale or rock underlying the sand. They could, of course, be grouted in holes drilled in the rock but the drilling procedure would probably run the cost up to where steel piles and possibly longer spans should be considered.

Obviously, locations of the kind just described present a problem that is different from those where the sand is deeper and the pile points stop in the sand. If the piles rest on a hard stratum, scour can extend almost down to it without causing trouble, whereas, the same depth of scour around friction piles might result in a washout.

I have in mind two examples that illustrate this point. The upper Red river in the vicinity of Altus, Okla., has a bed of about 25 ft of sand overlying hard clay. An 8-ft rise in this stream would probably result in scour to the clay but the piles might not wash out if there was little or no drift.

On the other hand in the middle Rio Grande the sand may be 50 to 75 ft deep below the normal streambed and, with approximately similar high water, a pile with 25 ft of penetration would likely be floating.

So-called permanent-type bridges in similar situations, with footings in but near the top of the hard stratum, may give trouble on account of the piers being undercut. This process is comparatively slow, however, and under aver-

by the use of T-rail anchors as previously described.

(4) The effects of scour on pile bridges can be lessened by keeping them as clear of drift as practicable during high water. A small crane of the type frequently used in rail-laying operations is useful for such a purpose.

(5) The writer considers riprap and steel jetties the most satisfactory types of bank protection for southwestern streams under average conditions but concrete slope walls can be justified for banks subject to very severe attack if suitable footings for the walls can be obtained.

(6) Often considerable protection can be afforded a caving or eroding bank simply by giving it a flatter slope, say 3 or 4 horizontal to 1 vertical. This operation greatly reduces the weight on the face of the bank, and the result is surprising to those who have not had the opportunity to see how it slows the rate of cutting.

(7) Scour below arches, pipes and small bridges with shallow footings sometimes threatens the structure. In new construction trouble of this kind can in most cases be prevented by seeing that the outlets of pipes and the floors of arches are not above the general grade of the channel projected back from a point several hundred feet down stream or from its confluence with a stream which is not lowering its bed; also that bridge footings are well below such a grade line.

(8) Where existing structures of the kind just described are threatened by back cutting in the channel, they can be protected by a concrete drop or similar structure below the bridge. Where bridge piers are involved they can be underpinned or extended downward but it is likely a drop structure would be cheaper.

age conditions probably will not amount to much in bridges less than about 30 years old. The possibilities should be remembered when considering the condition of older bridges with shallow footings in clay or shale. In older structures the presence of undercutting can be determined by soundings and by comparison with the as-built plans.

In new construction the possibility of trouble of this kind can be reduced, or the necessity for repairs postponed, by setting the bottom of the footings well into the hard material. My own judgment is that about five feet would be enough in hard clay or shale.

Where the footings of existing bridges are threatened by scour the trouble can be corrected in several ways. Probably as satisfactory and economical a method as any would be to excavate to the hard stratum, either by using a coffer dam or well points, and surrounding the pier footing with a reinforced concrete wall sunk five or six feet into the clay or shale. Any cavities under the pier would be filled with concrete and the space between the curtain wall and pier paved with concrete.

The matter of scour should also be kept in mind when designing bank protection on alluvial streams. Large rivers require special consideration but for most smaller streams riprap, or so-called "steel jetties," will likely be the most satisfactory kind of protection. These may sink in the streambed during rises, but it is a simple matter to restore the installation to its original pattern and it will finally become stable.

Pile dikes can be made effective but they require deep penetration to make them safe from scour.

Published information regarding scour is not very plentiful. Also, there does not seem to be any way to predict exactly how deep it may extend or what the relation will be between gage height and depth of scour.

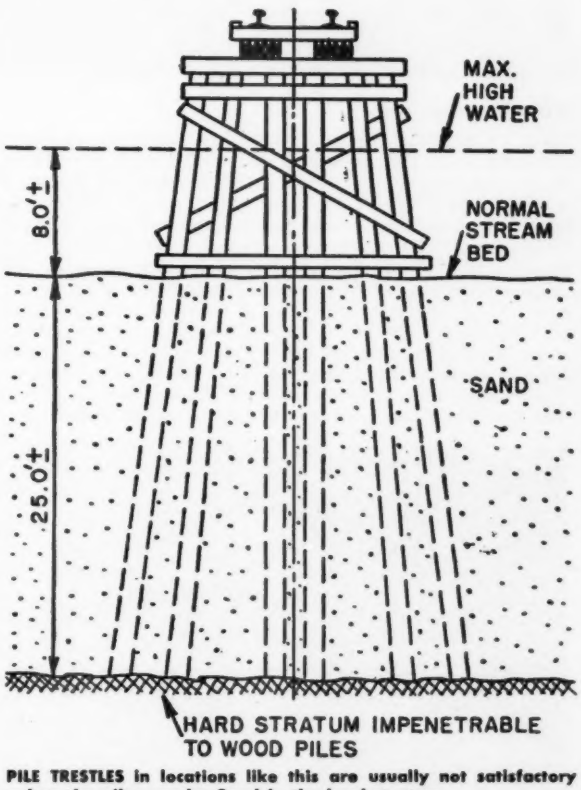
This situation creates troublesome problems when bridge foundations have to be designed for stream crossings where the sand in the channel is deep and flood velocities are high. But, notwithstanding the difficulties, some limit has to be fixed for the expected depth of scour.

A few suggestions have been made as to the probable relation between depth of flood water in the original channel and depth of scour. But these vary so widely they seem to have value chiefly in showing the uncertainties in the subject.

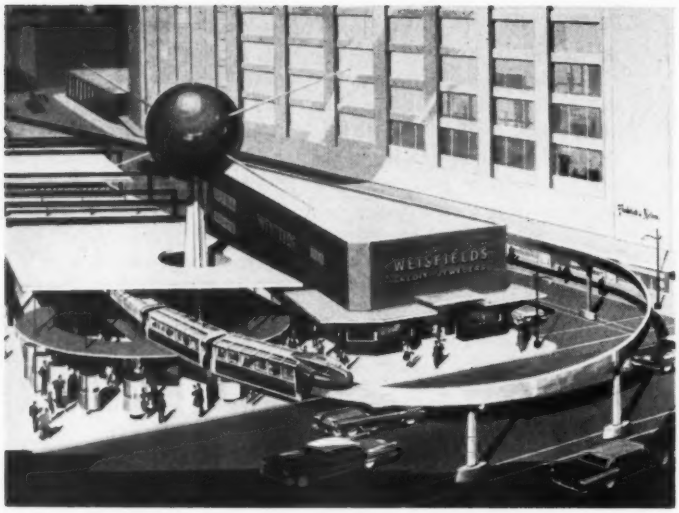
The writer's experience and observation lead him to believe the best way to approach this problem is by studying the history of structures on the stream involved and on similar streams. Usually there will be other bridges on the same or nearby streams where trouble of this kind has occurred. From this some idea can be formed as to what to expect.

With such information, and taking into consideration the nature of the streambed, height of design flood, effect of drift if spans are short enough to impede its free passage, and the velocity and duration of flow, the engineer should be able to make a reasonable estimate of the depth of scour.

Adequate consideration of this subject may save some lives and certainly it will save a lot of money. Also, it might prevent some division engineer from having a nervous breakdown in trying to decide whether or not to let a train over a bridge that is straining and creaking under the onslaught of a high flood.

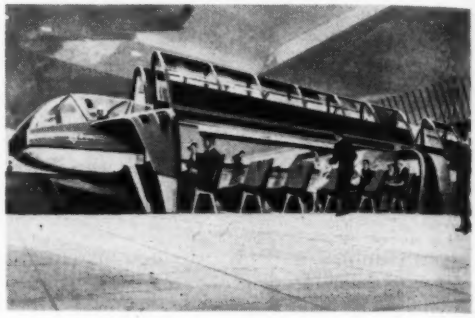


PILE TRESTLES in locations like this are usually not satisfactory unless the piles can be fixed in the hard stratum.

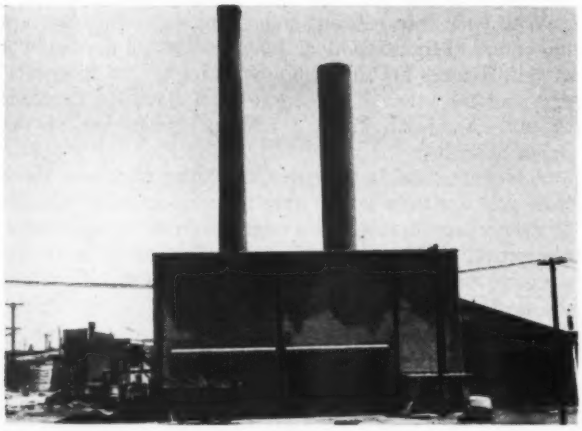


"Supported" monorail

Seattle, Wash., will have a $5 million "supported" monorail to transport visitors to its 1961 Century 21 Exposition. Prime contractor will be its designer, the Lockheed Aircraft Corporation. Three 4-car, 96-passenger "airtrains," will be mounted on top of a single rail (left). Top speed will be 60 mph. Sides of cars will open up to receive passengers (below).



News briefs in pictures . . .

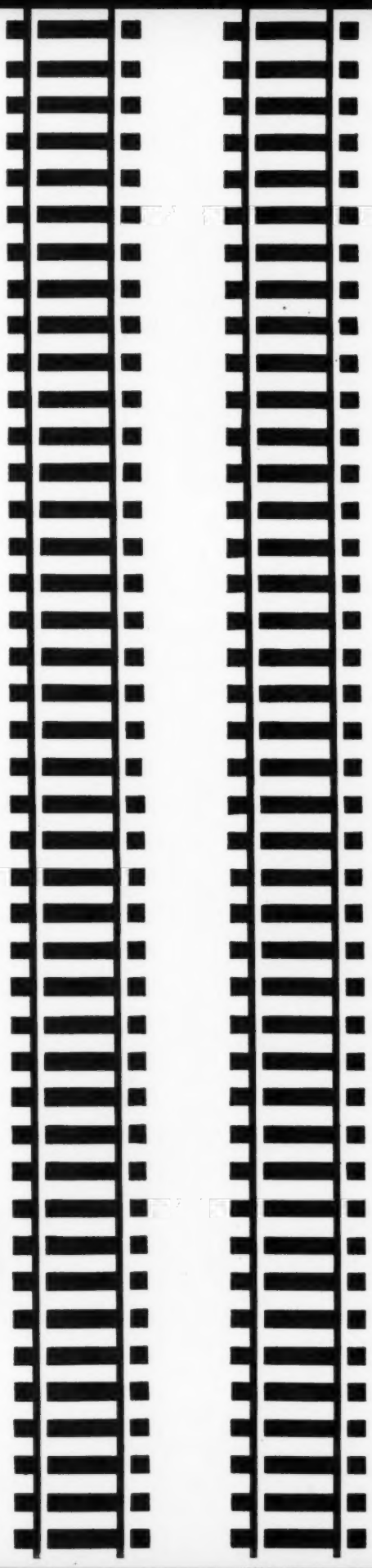


Rubbish disposal

From a yard power plant to a rubbish disposal plant. This is the recent history of the power plant (above) located at the C&NW's Proviso Yard west of Chicago. The railroad rented its facilities to a local scavenger service, the Van Der Molen Disposal Company, which added two incinerators adjacent to the boilers. Rubbish, collected by truck from 14 nearby towns, is dumped into a 400-ton receiving pit (below) where it is picked up by an overhead crane and dumped into a charging hopper which feeds one of the incinerators. In the incinerators the rubbish is burned at a temperature of 1800 deg F. The hot air thus produced is used to generate steam to serve the railroads needs in the vicinity. An excess of steam is produced which is available for sale to other industries. The railroad thus saves the expense of generating steam and Van Der Molen has an efficient means for rubbish disposal.

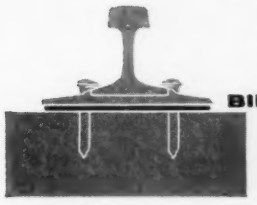
Yard television

In the New York Central's new Robert R. Young Yard at Elkhart, Ind., car numbers are relayed to the yard office by two television cameras. They are housed, as shown above, in an Armco S-1 steel, prefabricated building which is mounted on a tower. The yard's communication system also includes radio in the switching engines and Handy-Talky sets for the car inspectors.



tangent track

. . . cross ties give 50% more service when they are protected by Bird Self-Sealing Tie Pads. Average tie life is also extended at least 50% on curves, bridge decks, switch timbers, crossing frogs, highway grade crossings and other difficult locations. For proof positive, write for booklet to Department HTS.



In-track experience proves . . .
BIRD TIE PADS
save up to $1000.00 per mile per year

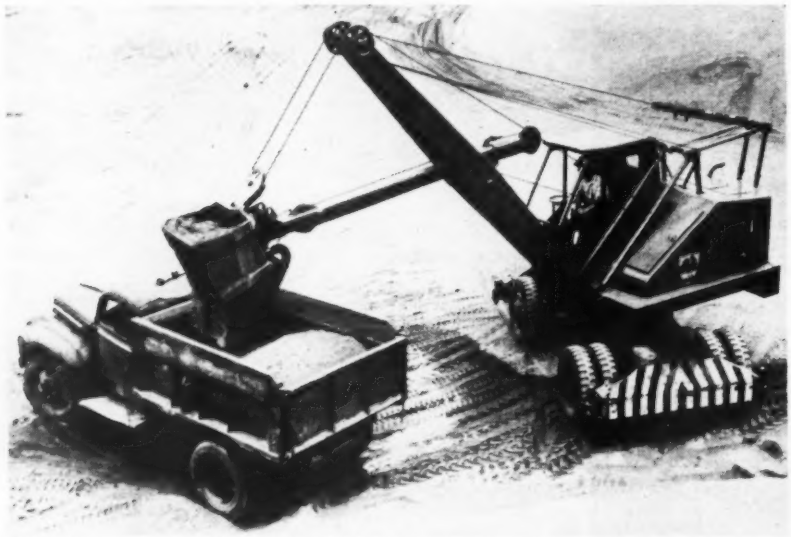
BIRD & SON, inc.
Established 1795
East Walpole, Mass.

PRODUCTS

For 1959 station wagon . . .

Hy-Rail equipment

MANUALLY OPERATED Fairmont Hy-Rail equipment is now available for installation on the Chevrolet 1959 Brookwood, Model 1235, 4-door, 6-passenger station wagon. The equipment is available with either steel or rubber-tread guide wheels that enable the unit to operate on either highway or railroad. The guide wheels are held in position by a separate mechanical lock and have the on-track load applied through a rubber-cushioned torque unit. The manufacturer will furnish the equipment for application to units owned by the railroads or the complete vehicle with the Hy-Rail assemblies already in place. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*



ONE-MAN operated self-propelled Model CR-350 Bantam has a lifting capacity of 11 tons. Other models include the T-350 carrier-mounted and the C-350 crawler-mounted Bantams.

New series of . . .

Crane-excavators

A COMPLETELY redesigned line of carrier-mounted, crawler-mounted and self-propelled ⅜-cu yd crane-excavators has been announced by the Schield Bantam Company of Waverly, Iowa. Designated the Series 350 Bantams, they are said to feature increased lifting capacities and greater flexibility in its complete attachment line. Three models are included in the new series, all equipped with mechanical controls—the Model T-350 carrier-mounted Bantam having a capacity of 11 tons, the Model CR-350 self-propelled Bantam also having a capacity of 11 tons and the Model C-350 crawler-mounted Bantam having a capacity of 8 tons. In addition the Company states that its line of crane carriers has been redesigned.

Major changes and improvements in the crane-excavators include a new turntable design featuring a combination hook and trunnion-roller design offering fewer parts, more equal load distribution, less wear and greater strength for the increased capacities. The machines are powered by Continental F-209 gasoline engines that are stated to add 14 per cent more horsepower to the new models. Optional features include diesel and electric power units, a two-speed transmission and torque convertor.

Model T-350 succeeds the previous T-35 Bantam. Its 11-ton lifting capacity is said to be the largest in the ⅜-cu yd field. It is also claimed to serve as a high-speed excavator. The T-350 is designed to work with any of the 11 front-end attachments and to be mountable on any of the four Bantam crane carriers.

The 11-ton lifting capacity of the one-man operated Model CR-350 is claimed to give it the largest lifting capacity in the ⅜-cu yd self-propelled field. Travel, swing and hoist are all independently controlled. One feature is a two-speed, no-shift, forward-reverse travel design with separate forward and reverse clutches. Other features include an automotive-type steering wheel which controls the hydraulic steering system, a 20½-ft turning radius, and either latch-type, screw-type or hydraulic lockout systems that are said to provide maximum stability during lifting and digging operations.

The Model C-350 is available with either standard side frames or long frames to provide extra stability. Features include independent travel, swing and dump, a two-speed travel design with independent forward and reverse clutches and a positive digging lock to prevent creeping during digging operations.

Attachments that are available for use on the new machines include a new deep-section crane boom in lengths up to 70 ft, a 10-ft jib, a standard backhoe, a new long-boom backhoe and various types and sizes of buckets. *Shield Bantam Company, Dept. RTS, Waverly, Iowa.*

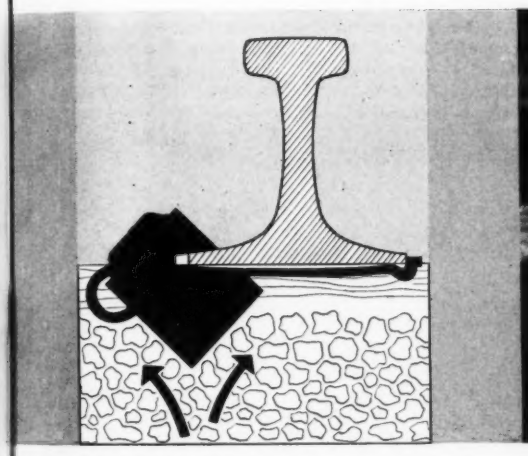
Take-off wheels on . . .

Equipment car

A NEW lightweight track-equipment car is available that has its own integral take-off wheels. Designated the Wheel-Master it has an all-steel chassis that is equipped with either 6-in or 14-in diameter insulated track wheels. Weighing 200 lb it is said to have a load capacity of 1500 lb. The 16-in diameter wheels, set to a 30-in wheel-

Welded Rail Needs Bulldog Rail Anchors

HOLDING POWER is the reason. No other rail anchor provides as much *immediate* and *sustained* holding power as a BULLDOG. That's because *only* BULLDOG is made with two factory-assembled parts that provide a two-way grip . . . with each part multiplying the holding power of the other.



BULLDOG ANCHORS keep their grip. Because sustained holding power is vital in anchoring welded rail, you need the unyielding grip of BULLDOG. Even frozen ballast can't break this grip because the point of the clamp pushes the ballast to either side.

AND BULLDOGS save you money. The deep, flat tie-bearing surface protects ties, won't disturb spike because it doesn't contact tie plate. Easy driving saves time. Can be reapplied with no loss of holding power. And BULLDOGS are easy to ship, easy to handle . . . cost no more.

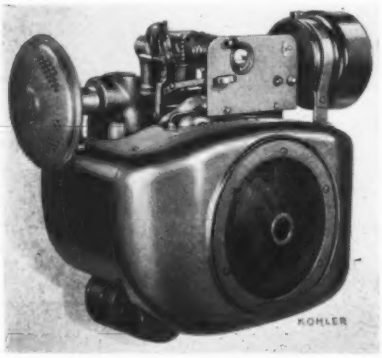
TO SUMMARIZE . . . Welded rail *demands* the sustained grip of BULLDOG anchors. You just can't afford to skimp on holding power. You get the savings of safe re-use . . . tie protection . . . easy, fast application. And you don't pay a penny more for BULLDOG advantages. Your True Temper representative has all the facts. Or you can write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks.

TRUE TEMPER®
BULLDOG RAIL ANCHORS

YOU CAN LOOK TO TT FOR LEADERSHIP

base, have 4-in by 8-in pneumatic tires that are claimed to permit one man to remove it from the track. This is done by sliding the small generator, compressor or pump being transported on the car to the take-off-wheel end. The other end is then picked up by the handles located there and the car wheeled off the track. *Teleweld, Inc., Dept. RTS, 11535 W. Franklin Ave., Franklin Park, Ill.*



Low silhouette for . . .

Air-cooled engine

TAILORED to small, difficult and hard-to-get-at installations the redesigned Kohler Model K662 engine has a new low silhouette which gives it a compact small-package appearance. This was accomplished by reducing the over-all engine size by lowering the silence muffler and the oil-bath air cleaner. The K662 engine is a 4-cycle, 2-cylinder, air-cooled model that weighs 230 lb and develops 15 hp at 1800 rpm, 20.2 hp at 2400 rpm, 23.4 hp at 3000 rpm and 24 hp at 3200 rpm. It is equipped with an external high-tension magneto and has tapered roller bearings on both ends of the crankshaft. Design of this model is stated to be specially suited for concrete mixers, elevators and construction equipment. *Kohler Company, Dept. RTS, Kohler, Wis.*

More corner prying with . . .

Tilt cylinder

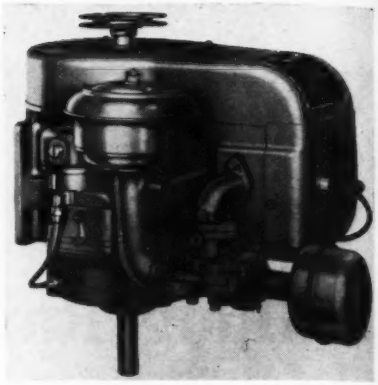
TREMENDOUS prying action on the corner of a blade is made possible by the use of hydraulic tilt cylinders on bulldozers. This action is especially important when rocks and stumps are being taken out, as well as in pioneer land clearing, dozing on slopes, or ditching, by enabling the machine to do a more effective job faster and more easily. The tilt cylinder replaces the left dozer brace only. The cylinder rod is designed to be half extended at level position of the blade, allowing it to tilt in either direction. The mechanism is available for installation on the Caterpillar D7S, D8S, D9S and D9U bulldozers. When the right tilt brace is fully extended and the cylinder completely retracted, the right corner of the blade is 27 in higher than the left on the D7, 26 in higher on the D8 and 24 in higher on the D9. Reversal of this procedure tilts the left corner higher than the right corner by the same amounts. When the right tilt brace is in neutral position, either corner of the blade can be raised above the other a maximum of 18 in on the D7 and 15 in on the D8 and D9. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*

●

High Horsepower in . . .

Vertical-shaft engine

A NEW heavy-duty, air-cooled, vertical-shaft engine has been announced by the Wisconsin Motor Corporation, Milwaukee, Wis. Designated the Model HAENL, it is the third model of this type manufactured by this company. It operates within a power and speed range from 4.7 hp at 1600 rpm to a top rating of 9.2 hp at 3600 rpm. With the addition of the Model HAENL the Wisconsin line of vertical-shaft engines now provides a selective power range of from 2.5 to 9.2 hp. A feature of the lubrication system of the new engine is the mounting of the oil pump directly on the vertical crankshaft for positive drive. A rotating vane-impeller, keyed to the crankshaft, delivers oil under constant pressure to a jet. The jet, in turn, directs a continuous spray of oil to the connecting rod and the tapered-roller main bearings. *Wisconsin Motor Corporation, Dept. RTS, Milwaukee, Wis.*



Lift 1800 lb with . . .

Hydraulic boom

MACHINES can be set off the track and ties or other material picked up by use of the model M900 hydraulic boom attachment. It is designed to connect easily into the hydraulic system of the tie-bed scarifier. The attachment has a load capacity of 1800 lb and a 180-deg swing. An actual 360-deg operation can be made by using the turntable of the scarifier to reverse its direction of travel. The boom is equipped with a two-way hydraulic ram which permits a travel of about 12 ft. The M900 attachment is furnished ready for installation on machines currently in use, two short lengths of rail being used as a counter-balance.

When it is desired to reverse the direction of the scarifier the boom can be quickly placed in the vertical position, under its own power, to balance the machine. By operating the machine in reverse direction and lowering the boom at right angles to the track, the manufacturer points out that the one unit can be used to renew ties as well as to scarify the tie beds. *Transport Products Corporation, Dept. RTS, 3008 Magazine St., Louisville 11, Ky.*

"Life of rail on high side of curve has been extended up to 300%."
"Outside rail on curves, formerly changed every two years, now transposed only when low rails become corrugated and flattened."
"Less gauging due to rail wear, saving labor and ties."
"Canting of rail on curves has been reduced."
"Significant reduction of wear on switch points, frogs, and special trackwork."
"Without track lubrication, leading wheels of diesels required turning for flange wear at 20,000 miles."
"250% increase in wheel life."
"Lowest maintenance cost."
"Best control of grease flow."

Talk about big savings!

These are typical results obtained by using Racor® rail lubricators. For savings like this on your road consult your Brake Shoe representative.

AMERICAN **Brake Shoe** COMPANY

RAILROAD PRODUCTS DIVISION
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Racor units lubricate up to 360° included angle of curve within ten miles of track. Additional capacity is obtained in multiple installations. Models available for both jointed and welded rail.

A-2993

WHAT'S THE ANSWER?

Installing flanged-wheel attachments

On what types of off-track equipment units is it desirable to install flanged guide wheels? Explain advantages.

Trucks and cranes

By E. W. Cox
Manager
W. T. Cox Company
Kansas City, Mo.

Several types of off-track equipment are now available with flanged guide wheels which allow their use "on and off rails." These include passenger vehicles, pick-up and panel trucks, truck cranes, snow-removal equipment, rail-testing vehicles and others.

This type of equipment is improved greatly whenever it is possible to utilize it upon rails or highways as needed. Most railroads believe that the cost of the flanged-wheel attachment is very nominal in view of the time savings which may be derived through the increased versatility realized by the use of such attachments.

Track inspectors utilizing flanged-wheel pick-up trucks or similar equipment are able to inspect their territory in one direction while returning to base point by highway or other line. This allows more frequent track inspection with limited personnel. Similarly, signal maintainers and other personnel can cover their territory in less time by eliminating slow dead-head return over the same trackage.

Supervisory personnel have found flanged-wheel vehicles excellent for track inspection inasmuch as the vehicles may also be used as transportation from point of inspection to headquarters, hotels, or other trackage without usual delays.

One railroad reports that a flanged-guide attachment on a truck crane enables them to cross a particular railroad bridge whereas the trip by highway to the other side of the bridge involves nearly fifty miles of circuitous travel.

Flanged-wheel attachments are also being adapted to air compressors, painting equipment, generating plants and other apparatus so that these devices may be towed behind a truck from point to point and hooked up behind a track motor car for towing to point of use where inaccessible to "off-track" vehicles.

In summary, we feel that the increased attention to the many types of equipment presently adaptable to flanged-wheel attachments provides an excellent indication of the growing need for the increased use of these units.

Make a study

By R. E. Sampson
Assistant Division Engineer
Boston & Maine
Concord, N. H.

Patrol or inspection crews, using a light highway truck with flanged guide wheels, are more efficient and can cover more territory. Their ability to move from one line to another over the highway greatly increases the territory which may be assigned to a crew. A greater variety of small material and tools may be carried enabling them to immediately repair minor defects which often are delayed or forgotten. Inspection visibility is increased so that a better and more complete inspection is made. Overtime is materially reduced or eliminated as the crew may return to headquarters over the highway. "Held out by trains" does not appear on time sheets as a reason for overtime. Special inspections after storms may be made quicker, reducing train delays.

A truck crane equipped with flange-guided wheels considerably increases its area of activity. With this device

NEW QUESTIONS to be answered in September

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: July 31

- 1. Where the track is being tightened in a "skin-lift" surfacing operation, how much additional ballast, if any, should be needed per mile? If needed, should this ballast be unloaded before or after the tamping operation?

- 2. When a pile being driven is found to be drifting off line, should it be withdrawn and restarted or should it be straightened while driving? Explain. Can straightening result in premature failure of a pile? If so, how?

- 3. Is it desirable and economical to have men work ahead of an undertrack sled or plow tapping down high spikes? What are the advantages, if any? Explain.

- 4. What factors determine when air-conditioning equipment shall be installed in a building? Explain. Should there be any uniformity in the type of equipment used at various locations? Why?

- 5. Why do main tracks on some lines, which ride so well between stations, give a rough ride through towns? Explain. What remedial measures can be taken to correct this condition? Are they economically justified?

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

it is no longer confined to work in areas available to trucks. All types of track and B&B work formerly confined to track-mounted cranes can be performed by a truck crane with the additional advantages of greater mobility to and from work, clearing for trains, reduction in time of movement from job to job and eliminating switcher service.

The addition of a set of guide wheels to trailer-mounted air compressors, cement mixers, electric welders, etc., enabling them to be towed by motor car to an isolated location from the nearest grade crossing might result in considerable savings if the volume of work warranted the additional expense.

An investigation should be made of the various types of off-track equipment assigned or available to determine the additional work and possible savings which would result if the equipment could be used on track. All details and factors must be weighed before any decision is made. Some equipment would not be used on track a sufficient time to warrant the cost of installation and maintenance of flange-guided wheels.

How to move surfacing equipment

With consideration to the cost of train crews as well as track gangs, is it more economical to move surfacing equipment to a new work location 80 to 100 miles distant under its own power, by train, or by railroad-owned or rented highway equipment trailers? Cite examples of comparative costs.

Not under own power

By JACK LARGENT
Supervisor M of W Equipment
Missouri Pacific
Palestine, Tex.

When practical, equipment should be moved over the week ends by rail. This applies not only to the equipment, but the entire gang as well.

It is not economical or practical to run most roadway machines over 20

Rock Island

MANNIX Sled is unloaded beside track and is introduced beneath track by jacking up rails and ties and pushing sled under with a bulldozer.

TRACK is lowered onto sled which is then coupled by cables to a locomotive.

HYDRAULIC PUMP is operated by one trackman while sled is in motion, for adjusting the tilt of the rear scraper blades.

SCRAPER BLADES are adjusted by hydraulic rams (one on each flap) for controlling digging action. Blade extensions were applied for widening roadbed.

Inquire about free showing of 16 mm. film on Mannix Plow (and Mannix Sled for raising track on new or old ballast). Ask for full details of Mannix service and special rental plan.

New Cost-Saving Operation

through use of HYDRAULIC CONTROLS

LATEST MANNIX Ballast Sled in use on the Rock Island railroad features a new factor which eliminates the piling up or bunching together of ties. The hydraulic controls give the operator a means of adjusting the leveling device to completely overcome the improper leveling of the old tie bed.

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What's the answer? (cont'd)

miles under their own power as most of the machines are built, or designed, for slow movement—such as chain driven, open gears, etc.

Company-owned low-boys are very practical in emergency movements, such has handling bulldozers and certain other classes of equipment to derailments.

On flat cars

By L. A. THOMAS
Roadmaster
St. Louis-San Francisco
Ft. Scott, Kans.

In a sense, we let the tail wag the dog. We schedule our maintenance work to take full advantage of available rail facilities.

Our greatest movement of surfacing machines occurs when a fully mechanized tie-and-surfacing gang moves from one division to another. This is usually a move of 80 miles or more. The work is programmed on a time basis instead of a strict mileage basis, enabling us to use week-ends for these long moves. This system not only reduces non-productive time but it also acts as a stimulus to the respective roadmasters to get the job done on schedule.

The machines are loaded on special company flat cars and, along with necessary supply, boarding and bunk cars, are handled in regular revenue trains. Hence, only pick-up and set-out time for the train crews is involved.

Only two sets of these special flat cars handle all movements of our system mechanized gangs. Normally, if a track has traffic to warrant the use of one of these large gangs, it will have sufficient trains to handle the gang with a minimum loss of time.

Ladder and grab-iron inspection

How often should ladders and grab irons on buildings, stacks, towers and tanks be inspected to insure their being in sound condition? How should they be inspected? Who should make the inspection and what should he look for?

Periodic inspection

By L. E. TITLOW
Assistant Engineeer of Bridges
Reading Company
Philadelphia, Pa.

The Reading has no set procedure for the inspection of ladders and grab irons which are considered part of a structure. Maintenance workers in the field and men constantly using such ladders report any conditions which in their opinion are unsafe or need attention, to their immediate officers. A detailed inspection is then made by a capable engineering department representative. Inspection is made and the necessary corrective measures taken.

Local conditions govern the extent of necessary repairs. Ladders at engine facilities are subjected to more use and exposed to more damaging factors than others, requiring more maintenance as a rule.

The Reading is quite safety conscious and an extensive program of safety is constantly before the employees. Ladders and their use are given much attention. All employees using these facilities are given constant reminders and rules have been established for their proper use. As a result, employees are quick to call attention to any conditions needing attention.

We feel that a periodic inspection should be made of all ladders, preferably once a year, by personnel qualified to determine the condition of steel, methods of fastening, and the condition of the masonry to which the ladder may be attached. Inspectors should look for loose attachments of the rungs, side rails or cages; oxidation, particularly on rungs and side rails; loose bracing, where the ladder is braced or attached at intermediate points along its length; and for missing bolts, rivets or fastenings. Condition of the painting also should be noted in order to prevent the occurrence of future trouble.

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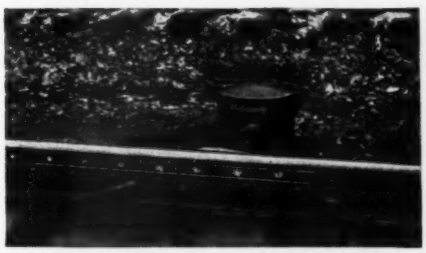
GIVES PROVEN RAIL PROTECTION

IN ALL WEATHER. One grade for year-round use. Many major railroads use Mobil Curve Grease 1105 under ambient temperatures ranging from 100° F. to 30° F. below zero.

ON SHARP CURVES . . . ON LONG CURVES. Made from selected oils and graphite and properly compounded to give maximum lubrication with minimum consumption. Has remarkable ability to cling to wheel flanges and carry great distances from the lubricator.

UNDER HIGH-SPEED, DENSE TRAFFIC. Mobil Curve Grease 1105 is extremely tenacious. A special additive is built into it to eliminate "splatter" under high-speed train operation and at high temperatures. Don't settle for inferior performance, use Mobil Curve Grease 1105.



Service experience has proven that Mobil Curve Grease 1105 gives outstanding performance in the lubricator—no separation, no line plugging and no variation in feed.

Mobil

RAILROAD PRODUCTS

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What's the answer? (cont'd)

Once a year

By SUPERVISOR B&B

Ladders and grab irons on buildings, towers and tanks are inspected at least once a year. You understand, of course, that no special inspection is made of these items; their inspection occurs as part of the regular bridge or building inspection carried out annually.

For instance, the condition of a roof may want to be inspected. The ladder would be used to get to the roof. If anything is wrong with the ladder, it will be noted while being used. The B&B supervisor does the inspecting.

Grab irons on tanks and towers would get inspected once a year the same way—through use. Any looseness would be made known as soon as a person grasps the iron and before trusting his weight to it. Safety cages on tanks also are examined during the annual inspection.

Grab irons on stacks and chimneys are another animal. No attempt is made to mount all these irons to the top during the annual inspection. If, from the ground, the inspector should note anything amiss near the top of a stack, he or one of his men might climb the irons. I say "might," but the chances are that a contractor would be called in to make an inspection and submit an estimate for remedial work. Not many men are comfortable on grab irons at great heights and it is better for all concerned to have an outside expert do this inspection, if at all possible. That is, provided that appearances from the ground indicate the need for a close inspection.

Fire escapes on buildings get inspected at least once a year and more often as local ordinances may require them. These are inspected by the supervisor of B&B and by others as necessary.

Use qualified inspector

By R. E. PECK
Bridge Engineer
Missouri Pacific
St. Louis, Mo.

Ladders and grab irons should be inspected at least once a year to insure that they are in satisfactory condition for safe use. If such a schedule has been followed, the inspection presents no particular problem.

However, in cases where inspection has been deferred for several years, special precautions should be taken to safeguard the inspector. These may include the use of safety lines or a "bosun's" seat where the condition of the ladder or its connections to the structure are questionable.

The inspection should be made by a man who is qualified by experience and judgment to evaluate the condition of the ladder and connections from a safety standpoint and determine the character and extent of work required to correct any unsafe conditions that may exist.

Ladder connections should be carefully inspected, particularly in cases where they consist of anchor bolts embedded in concrete. The inspector should bear in mind that there can be no compromise where the matter of safety is involved.

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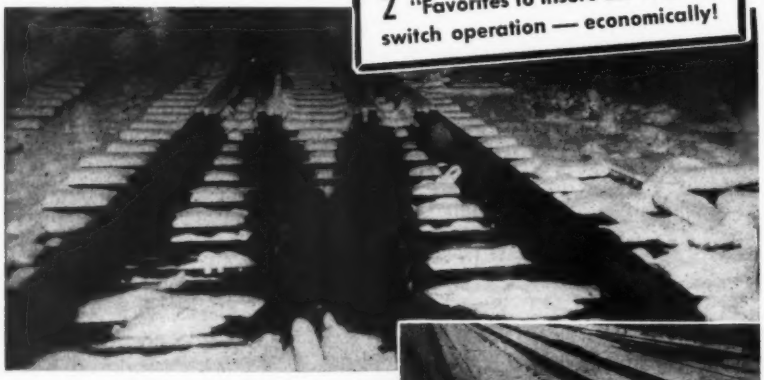

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Replacing stone tunnel linings

What is the best material and most economical method which can be used to replace stone tunnel linings under traffic? Explain. Should the new lining material be varied to suit wet and dry tunnel conditions? Why?

Use tunnel liner plates

By HERBERT CLARK
Manager—Railroad Sales
Great Lakes Division
Armco Drainage & Metal Products, Inc.
Chicago, Ill.

The use of galvanized steel tunnel liner plates for lining old stone tunnels, under traffic, satisfies the requirements of sound engineering design, minimum interference to traffic, durability and economy. They have been used on many large tunnel-lining jobs.

Armco Liner Plates have the built-in strength necessary for heavy loads, resulting from their deep-corrugation section with the corrugations carried through the longitudinal joints. Because they have a width of 18 in and come in lengths of 37¾ in, 44 in and 50¼ in, they are light enough to be handled without cranes or other expensive lifting equipment. When several plates are bolted together at the longitudinal seams, the resulting unit covers 18 in of tunnel length. Successive units are bolted together through the side flanges of the plates.

The plates are accurately fabricated and curved so that they will bolt together easily on the job to form an arch following the desired cross section. Several radii can be shop-fabricated into the lining for those cases where the top of the existing tunnel is not a true circular arc. The arch is erected in place, with the base resting in anchor channels set in concrete bench walls. The annular space between the old masonry and the new lining (usually a space af about 3 or 4 inches) is then filled with grout under pressure. Grout couplings can be fabricated into a number of the plates for connecting the hose from the grout pump.

On the larger jobs it may be desirable to pre-assemble individual rings outside the tunnel entrance and carry them into the tunnel with a small crane

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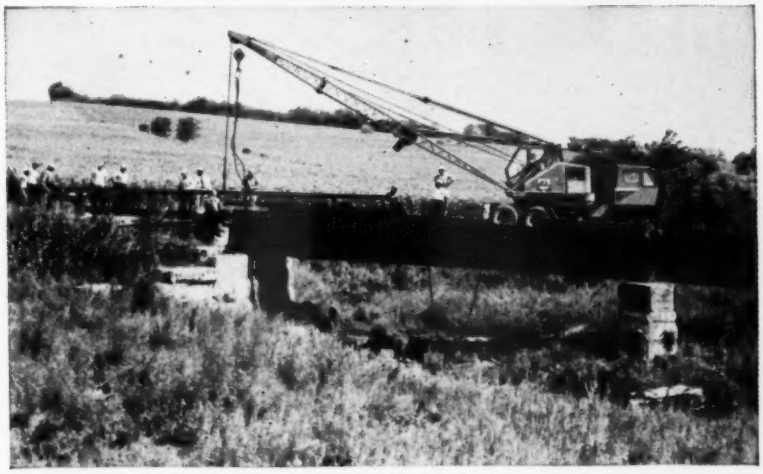

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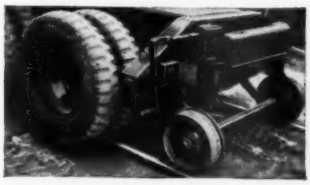

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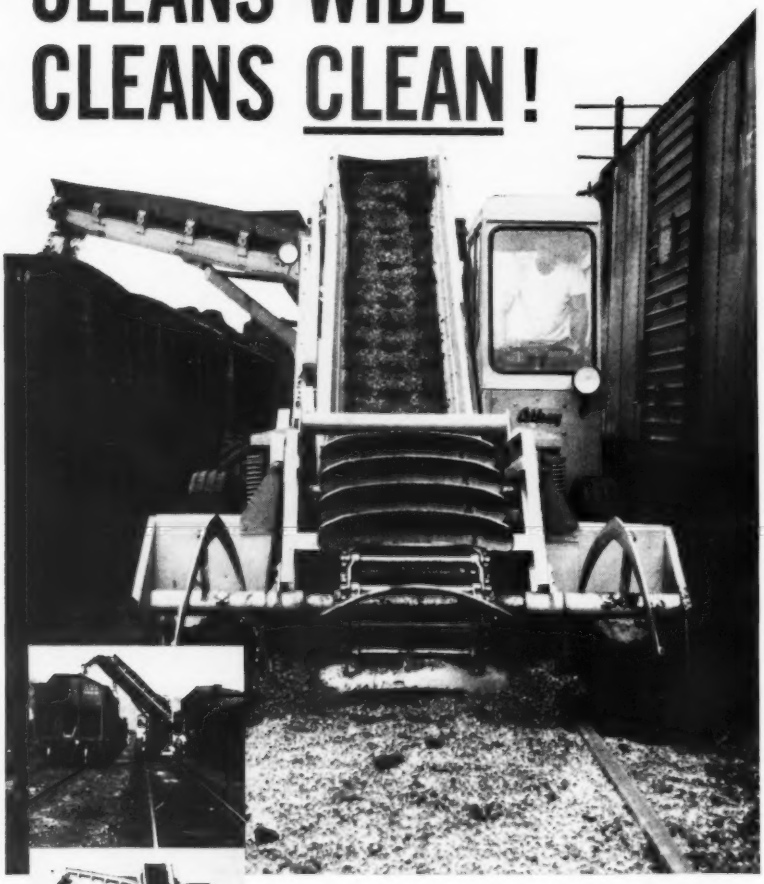

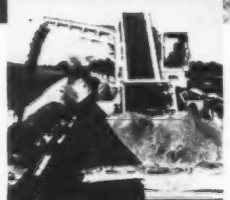

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What's the answer? (cont'd)

and a lifting frame, setting each ring in the anchor channels against the previous ring. This scheme was used on a recent tunnel lining job in California by one of the large railroads, and resulted in erection economies. The rings were carried into the tunnel between trains with no interruption to traffic.

Where the existing tunnel is of such dimensions that a reduction in clear height and span cannot be tolerated, it may be possible to remove a part of the old lining, which may, in fact, be in poor condition, and then reline the structure with liner plates with little or no reduction in cross section.

Tunnel Liner Plates can be used in wet as well as in dry tunnels and the grouting operation behind the plates will seal off many of the cracks and crevices through which water is seeping into the tunnel.

Programming rail-end welding

Should the building up of rail ends by welding be programmed on the basis of the average depth of batter or by years in service? If by batter readings, what depth influences the decision to weld? If by years, how many? Explain.

Depth of Batter

By W. E. CORNELL
Engineer of Track
New York, Chicago & St. Louis
Cleveland, Ohio

In my opinion, the depth of batter is the prime factor as to when rail ends should be built up. It is also my opinion that the depth of batter is directly related to the factors of tonnage carried and speed of trains.

It would be most difficult to comparatively evaluate, or assign values, to the contribution made by rail-end batter to the wear and tear on the track and structures. I think it will suffice to say it includes the entire track structure, beginning with the subgrade and bridge structures and

No. 977 helps scale 200 cuts between Parkersburg and Clarksburg, W. Va., for the B & O. Reports Don R. Sensabaugh, system tunnel supervisor: "Best feature of the No. 977 is its ruggedness. Working in close quarters, ease of operation, as well as its versatility, make it an ideal tool for our operation."

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What's the answer? (cont'd)

running through the ballast, ties, tie plates, spikes, bolts, joint bars, the rail outside the joint bar areas, to and including the equipment moving over the rails.

Many roads, including our own, consider an average batter of .030 in as about the proper time to build up rail ends. When such an average figure is established as a basis, we frequently find that it is greatly exceeded, with a number of joints showing .060 in to .080 in or more batter.

Rail-end batter increases at an accelerated rate. I have, on occasion, observed seven-year-old rail with an average of .010 in batter adjacent to eight-year-old rail of the same section, weight, tonnage and train speeds showing an avearge batter of nearly .020 in.

It is my opinion that .030 in batter should be established as the allowable maximum for first-class, high-speed main track.

Average batter depth

By K. C. Morriss
Assistant Division Engineer
Chesapeake & Ohio
Ashland, Ky.

The welding of rail ends must definitely be programmed if the rail joint is to be properly maintained. It is difficult to say without qualifications whether this program should be based on average depth of batter or on the years of service.

In addition to years in service, factors such as tonnage, speed and the standard of maintenance contribute greatly to the development of rail-end batter. The period of time required to develop batter sufficient to justify welding varies greatly between supervisors' territories, as well as between locations within a territory. Therefore, a program based on years in service must be adapted to fit the individual situation.

Our experience has been that it is better to program our rail-end welding on the basis of average depth of batter as measured by actual field inspection.

Defining the rail-end batter as being the distance in thousandths of an inch between the bottom of a 14-inch straight edge and the top of the rail,

measured by inserting a taper gage between the straight edge and the rail head at a point ½ in from the end of the rail, it is our practice to restore to their original contour rail ends with a batter of .030 in or more.

Consideration should also be given to working the rail-end welding program in conjunction with the out-of-face track-surfacing program. It is difficult to maintain the rail joints to any high standard of maintenance if the batter is enough to require welding. It would be well to consider all track-surfacing locations for possible welding, as a good joint condition might lengthen the surfacing cycle.

One-eighth inch

By W. L. O'DELL
Field Engineer
Alton & Southern
East St. Louis, Ill.

The Alton & Southern is a short-line switching railroad in the Greater St. Louis—East St. Louis, area. Due to the heavy concentration of industrial spur tracks, sidings, railroad connections and crossings in this area, we have adopted a program of building up rail ends by welding on the basis of average depth of batter.

After the section foreman reports a number of battered joints in a track, the track welder is sent to repair them. The track is first raised out of face and each joint checked with a straight edge. A joint having a depth of batter in excess of one-eighth inch is built up.

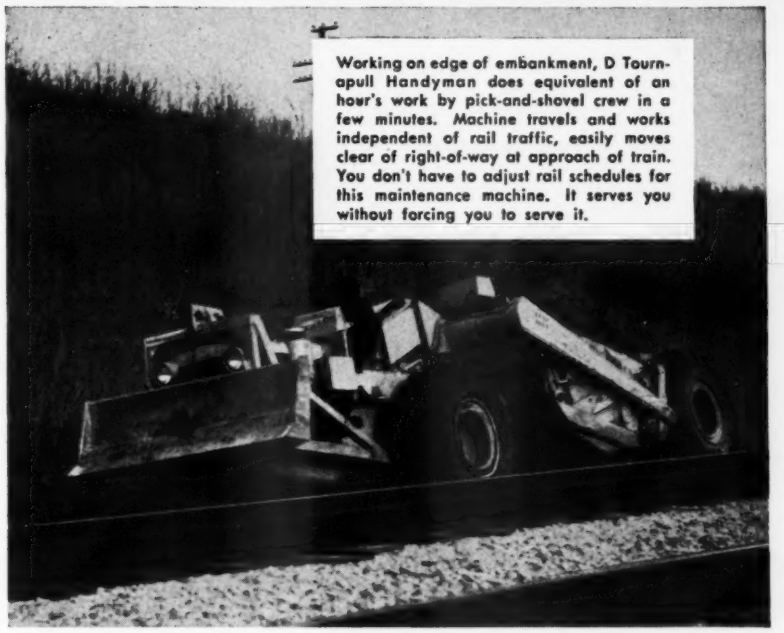
Particular attention is given by the trackmen to the joints in crossings and turnouts and to those joining new rail to old rail. And, of course, the badly battered joints are rebuilt when reported.

Length of batter

By C. W. MCKEE
President, Teleweld, Inc.
Franklin Park, Ill.

Rail-joint batter conditions have materially changed in recent years with the universal use of end-hardened, control-cooled rail. Our experience indicates that such rail is usually eligible for rail-end welding after 120 to 140 million tons of traffic where four-hole bars are used.

When these tonnage figures are reached, the receiving rail will usually


Working on edge of embankment, D Tournapull Handyman does equivalent of an hour's work by pick-and-shovel crew in a few minutes. Machine travels and works independent of rail traffic, easily moves clear of right-of-way at approach of train. You don't have to adjust rail schedules for this maintenance machine. It serves you without forcing you to serve it.

Save time and expense on right-of-way maintenance

handle scattered clean-up with 1-man D 'Pull*

NOW much of the load-haul-and-spread operations on your right-of-way maintenance can be a one-man, one-machine operation—with the LeTourneau-Westinghouse D Tournapull® Handyman. This self-propelled, rubber-tired scraper isn't tied to rails. 138 hp, 9-yd "D" can be push-loaded, or will self-load up to about 75% of capacity. It travels shortest route to work — via right-of-way, highway, or cross-country — at speeds to 29.5 mph.

Once the 'Pull operator has his orders, he's on his own — doesn't have to wait around for a crew, work train, or dispatcher orders. Nor does he have to wait for main line clearance. He goes directly to his work, at roading speeds to 29.5 mph . . . gets into action as soon as he arrives!

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Low-pressure tires of D 'Pull provide a smooth-rolling surface for travel. Yet, tire lugs bite in deep when pulling power is needed. These 5'-high, 1½'-wide pneumatics flex over rails, ties, and other obstacles with a cushioning action . . . roll across tracks or over switches without causing or taking damage.

For close work in confined quarters — a common situation on right-of-way embankments — "D" has high maneuverability. This L-W Handyman turns 180° in 24'8" . . . eases through narrow 8' cuts . . . travels via highway in all 48 states without permit. Electric controls are quick and positive.

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A dozer blade is available for the D 'Pull. The hauled scraper can also be interchanged with a Rear-Dump body behind the same prime-mover, for hauling shovel-loaded material. Or with a lift-and-carry crane, with an arch suitable for hauling rails, poles — equipped with 61,500-lb-pull electric winch. Also available are interchangeable flatbed and side-dump haulers.

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What's the answer? (cont'd)

be .030 in to .035 in low from a combination of batter and mismatch. A proper weld would be 9 in to 10 in long including the secondary batter that usually appears behind the so-called 'bolt-hole hump" in end-hardened rail. These figures are based on readings taken on rail in track that has had good maintenance. If track has not been adequately maintained, the batter readings and length of welds will be greater than those shown.

Of prime importance is the fact that batter—and the resultant length of weld—grows at a continually accelerating pace. Assuming that 130,000,000 tons of traffic create the need for a 10-in weld, it can be stated that the initial weld length has increased at the rate of .077 in per million tons of traffic. However, this rate of weld-length increase does not continue uniformly but actually accelerates. For example an additional 20,000,000 tons of traffic will increase the weld-length requirement to 12 in, the additional weld length of 2 in being created at the rate of .100 in per million tons.

Assuming that rail-end welding can be properly done for a cost of 25 cents per inch of weld, providing a per-joint cost of $2.50 for 10-in joints, the cost is 1.9 cents per million tons of traffic. If the weld requirements average 12 in the cost is 2.3 cents per million tons. This cost per million tons will continue to increase at an accelerated rate.

As the length and depth of batter increases, the expense necessary to maintain proper bolt tension and surface of the joints likewise increases at a comparable accelerating rate. Considering these circumstances, it would appear that the most economically feasible time to program rail joints for welding is when the length of batter is within or near the 10 in limit.

Many factors involved

By K. J. DeCamp
Assistant Supervisor Work Equipment
Chicago, Rock Island & Pacific
Chicago

Many factors are involved in programming rail-end welding. The major factor is, of course, the average depth of actual batter, followed

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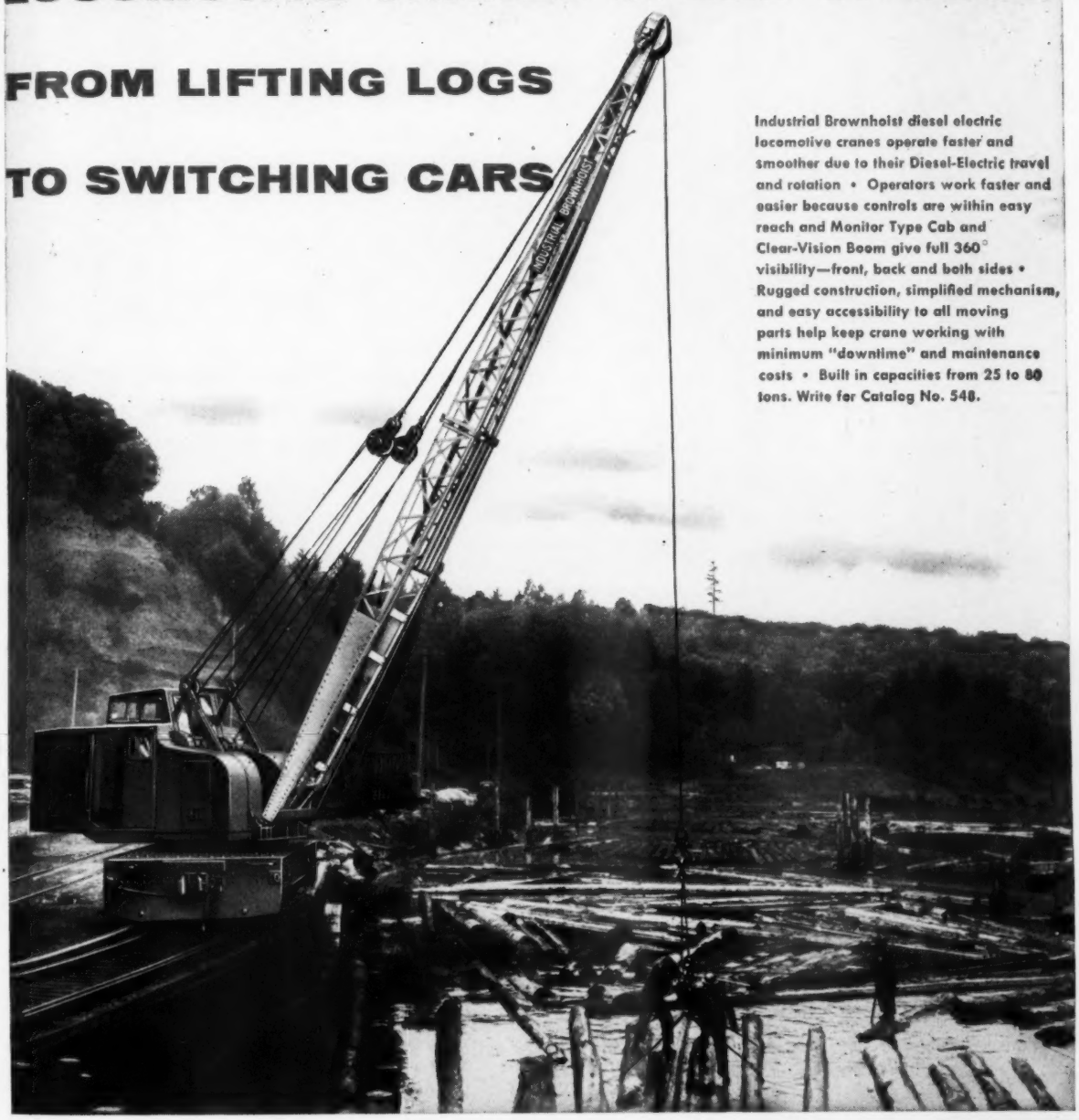

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What's the answer? (cont'd)

closely by tonnage over a given territory, condition of the joint bars, condition of the rail as a whole, whether or not a relay program is scheduled within the next three years, whether the rail is hot-bed or control-cooled, and, of course, the amount of money available for the work.

For example, let's consider 20 miles of track reported by the district as needing rail-end welding. A field check by the system welding supervisor should be made, and he should record the batter readings of at least 40 joints out of face per mile. He should remove one or two pairs of joint bars within the check area in each mile, and record the joint-bar wear and its condition. A pair of reformed bars with a specified crown should then be applied and another reading taken, recorded and compared with the original reading. This will determine how much of the reading is actual batter and how much is caused by badly worn or bent joint bars, thus determining the amount of correction to be gained by the application of reformed bars.

Let's assume that in this 20-mile stretch, the original readings indicate an average batter of .050 in. Bars are worn an average of .025 in and many of them badly bent. By application of reformed bars, it is determined that the batter recording is decreased .020 in or 40 per cent. This results in an actual batter average for the stretch of .030 in. This stretch would then be tentatively programmed for reformed bars followed by rail-end welding out of face.

Should the majority of joints have a reading of .025 in or less, but contain approximately 20 joints per mile having readings of from .050 in to .090 in, spot welding and bars should be considered.

After all such areas are so checked and figures compiled, it is necessary to consider all factors systemwise to determine exactly what areas are in the greatest need of rail-end welding for the ensuing year, finances being a controlling factor.

The years-of-service factor has comparatively little to do with programmed welding, the many other factors ruling. In general, average actual batter of .030 in or more should be programmed for welding out of face.

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- Virtually eliminates "fog" and overspray.
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- Requires low volume of air . . . only about 5 cfm per spray gun.
- No atomizing air required.
- No paint heaters required.

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Biographical briefs (cont'd)

(Continued from page 10)

East Pittsburgh, and in 1944 was promoted to structural engineer. He was appointed chief draftsman in 1947 and resident engineer in 1950. In February 1951 he was promoted to bridge engineer, the position he held at the time of his recent promotion.

W. M. Price, 31, who was recently promoted to assistant division engineer on the Canadian Pacific at Montreal, Que. (*RT&S,* Mar., p. 10), was born at Vancouver, B. C., and graduated from the University of Manitoba in 1949 with a Bachelor of Science degree in civil engineering. Mr. Price entered the service of the Canadian Pacific in 1946. He was appointed transitman at Brandon, Man., in 1949, subsequently serving in the same capacity at Medicine Hat, Alta., and Smiths Falls, Ont. In 1954 he was promoted to resident engineer at Hemlo, Ont. He was serving in this capacity at Agincourt, Ont., at the time of his recent promotion.

Paul F. Gotch, 41, who was recently promoted to supervisor track on the Illinois Central at Freeport, Ill. (*RT&S,* Mar., p. 10), was born at Sioux Falls, S. D., and graduated from Washington High School, St. Paul, Minn. He entered the service of the Illinois Central in 1938 working in the Chicago terminal and Markham yard. In 1942 he was promoted to assistant foreman and two years later was further promoted to foreman. Mr. Gotch spent four years in military service, a portion of which was served in the European Theatre of Operations.

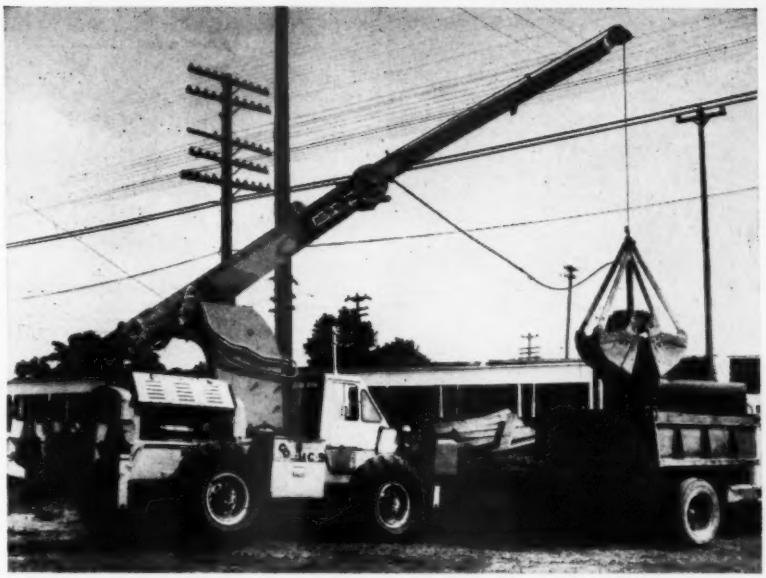
Louis Mayersky, 50, who was recently promoted to master carpenter at the Jersey City Terminal of the Jersey Central (*RT&S,* Apr., p. 10), was born at Elizabeth, N. J. He entered the service of the Jersey Central in 1929 as a carpenter. Mr. Mayersky was promoted to assistant foreman in 1940 and advanced to foreman in 1945. In 1954 he was appointed building inspector and two years later was promoted to assistant master carpenter, the position he was holding at the time of his recent promotion.

Association News

American Railway Engineering Association

A number of standing committees have scheduled meetings to be held in June. These include the following:

Buildings, June 18-19, Cincinnati, Ohio, including inspection of the Armco plant at Middletown, Ohio; Wood Bridges and Trestles, June 11-12, Brown Hotel, Louisville, Ky., including inspection of gluing and laminating operations at the Gamble Brothers plant; Highways, June 18, Penn-Sheraton Hotel, Pittsburgh, Pa.; Engineering and Valuation Records, June 16-17, Penn-Sheraton Hotel, Pittsburgh, Pa.; Yards and Terminals, June 8-9, Penn-Sheraton Hotel, Pittsburgh,



Model 210 A-W Hydraulic Crane, equipped with clamshell attachment on 10-ft. boom extension, performs yard maintenance work at the C&O's Plymouth Yard in Michigan.

C&O terminal supervisor of track says:

Maneuverable, maintenance low . . . Austin-Western Hydraulic Crane good for all-around work

"The Austin-Western Hydraulic Crane is a good all-around piece of equipment for railroad terminal maintenance work," comments Harry Haines, supervisor of track of the Chesapeake & Ohio's Detroit Terminal.

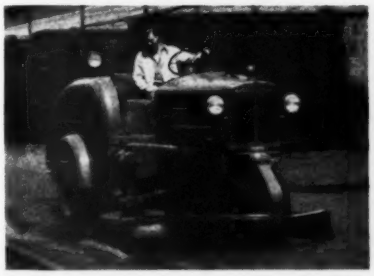
Goes anywhere to do anything

Mr. Haines adds, "This piece of equipment is very versatile and has no trouble navigating over rough terrain or railroad tracks. We use it as a crane to unload ties and handle rail and other track material, and at times attach a ⅜-cu.-yd. bucket for redistribution of ballast, cleaning ditches, etc."

All-wheel drive and steering

Learn more about versatile A-W hydraulic cranes. Telescoping booms swing 360°. Self-propelled, rubber mounted—gasoline or diesel powered. 5 models—110, 210, 210-P, 220 and 410. All-wheel drive and steering assure plenty of power and traction . . . outstanding maneuverability. Also available for truck or stationary mounting.

Rail crane attachment optional for on-or-off track operation. New disconnect clutch, optional with Ford 332 gas engine, permits road speed of 35 mph plus! Attachments include remote control maintenance platform, orange peel and clamshell buckets, magnet, and load-carrying platform. Contact your Austin-Western distributor today for full information or write to us.



Keeps yards, terminal areas extra clean—A-W Motor Sweepers in 2-yd. and 4 plus-yd. models.

Austin 1859 AUSTIN-WESTERN 1959 100th YEAR PARTNERS IN PROGRESS Western
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Power graders • Motor sweepers • Road rollers • Hydraulic cranes

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GEARED HEAD WRENCH
MORE POWER • LESS EFFORT

The X-4 is NOT a ratchet wrench but a HEAVY-DUTY GEARED TOOL

POWERFUL! — Geared head construction generates high torque (4 to 1 ratio) with a fraction of effort. Designed compactly for maximum strength . . . minimum weight.

EFFICIENT! — Eliminates the need for extra man-power. One man can use it — anywhere. Unequaled where space is limited.

SAFE! — Allows workman to perform his duties without excessive strain or fatigue. Hazards of impact or sledge type wrenches are eliminated.

VERSATILE! — Light — compact. All standard torque wrenches can be used with the X-4. Available in 3 sizes. Torque capacities up to 4000 foot pounds.

For complete information see your local distributor or write direct to:

X-4

The X-4 CORPORATION
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Association news (cont'd)

Pa.; Economics of Railway Location and Operation, June 11-12, Queen Elizabeth Hotel, Montreal, Que., including inspection of the Canadian National's new Montreal freight terminal; Maintenance of Way Work Equipment, June 8-9, Pfister Hotel, Milwaukee, Wis., including inspection trip to the plants of Wisconsin Motors, Inc., and Nordberg Manufacturing Company; Waterproofing, June 9, AAR Research Center, Chicago.

Two meetings have been scheduled to be held in July. These are as follows: Iron and Steel Structures, July 22-23, Pick-Fort Shelby Hotel, Detroit, Mich., and Economics of Railway Labor, July 13-14, Piedmont Hotel, Atlanta, Ga.

Chicago Maintenance of Way Club

The annual meeting of the club was held at the Hamilton Hotel, Chicago, on April 27. The following officers were elected:

President—Walter A. Buckmaster, assistant division engineer, Baltimore & Ohio Chicago Terminal, who was advanced from first vice-president; first vice-president — John L. Perrier, division engineer, Chicago & North Western, who was promoted from second vice-president; second vice-president —Charles E. Weller, assistant engineer maintenance of way, Illinois Central; executive secretary—Merwin H. Dick (re-elected), editor, *Railway Track and Structures;* secretary-treasurer—Joseph S. Kopec, assistant engineer, Milwaukee Road.

Directors elected for terms of two years are: Gerald M. Magee, director of engineering research, Association of American Railroads; Herbert R. Miller, representative, Linde Company; and Arthur B. Hillman, Jr., assistant chief engineer, Chicago & Western Indiana.

Metropolitan Maintenance of Way Club

At the annual meeting of this club, held at the Railroad Machinery Club, New York, on April 30, all its top officers were re-elected to serve during the ensuing year. They are: President—E. C. Lawson, division engineer, Reading, Philadelphia, Pa.; first vice-president—W. D. Almy, engineer maintenance of way, Central of New Jersey, Jersey City, N. J.; second vice-president—J. W. Cummings, supervisor of work equipment, Delaware & Hudson, Colonie, N. Y. Roderick Craib, associate editor, Railway Age, was elected secretary-treasurer.

Supply Trade News

A. M. BYERS COMPANY—The following appointments have been announced: **G. C. Kimbrough** as field service engineer with headquarters in the Atlanta (Ga.) division office; **Richard G. Hume** as field service engineer with headquarters in the regional

Piling Specialists to the Railroads

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"Faster-from-Foster" service is your assurance of on-time deliveries—anywhere in the country—from Foster's nationwide warehouse and field stocks.

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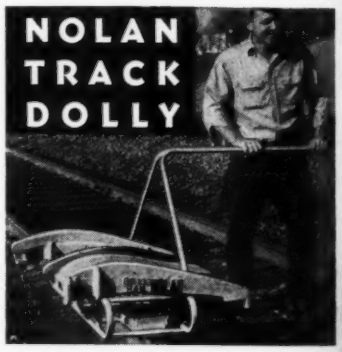


You can get rails, ties, supplies, tools, rerailers, etc., to the job with money-saving speed and efficiency, when you equip your crews with the Nolan Track Dolly.
Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads.

STANDARD DOLLY

Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.

INSPECTOR'S DOLLY

Length	Width	Ht. Above Rail	Weight
36 in.	14 in.	6 in.	60 lbs.

NOLAN TOOL AND SUPPLY CAR

2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections. Platform size 48" x 45" Ht. above rail 8" Weight 140 lbs. complete.

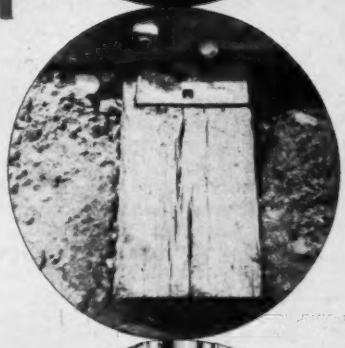
Write for complete railway supply catalog.

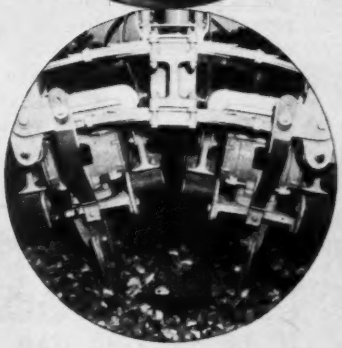
THE NOLAN COMPANY
166 PENNSYLVANIA ST., BOWERSTOWN, OHIO

THE JACKSON TRACK MAINTAINER

does a Marvelous Job!

In Cemented Ballast— Largest Rock or Anything in Between–





Which accounts for the fact that there are more of these machines in daily use than all other tampers in its category combined.

Write, wire or phone for details of construction and operation which constitute the basic reasons why this machine offers unrivalled opportunity for both constructing and maintaining track of finest quality at the lowest possible cost per mile.

Supply trade news (cont'd)

office at Boston, Mass; **Harry M. Wagner** as railroad service engineer with headquarters in the regional office at New York.

CARTER BLATCHFORD CORPORATION—This company has announced it has moved into a new office located at 901 Ridgeway Ave., Aurora, Ill.

HUBBARD & CO.—According to a recent announcement, the New York sales office of this company, including its Unit Rail Anchor division and Tool division, has moved to 790 Broad St., Newark 2, N. J.

LINDE COMPANY—Richard W. Torbert, 56, has retired as manager, engineering service, railroads, of this company which is a division of Union Carbide Corporation. He is now living in Arroyo Hondo, N. M. Mr. Torbert was born at Ocean City, N. J., and graduated from the University of Delaware in 1926 with a Bachelor of Science degree in civil engineering. He joined the Reading Company after graduation and subsequently became supervisor of track at West Trenton, N. J. Mr. Torbert joined the Oxweld Railroad Service Company in 1941 as assistant chief engineer. In 1953, when Oxweld was merged with the Linde Company, he became manager, engineering service, railroads, of the latter company.

NATIONAL ALUMINATE CORPORATION — The recommendation of this company to change its name to **Nalco Chemical Company,** as announced in the May issue, was approved by the stockholders at the annual meeting held at Chicago on April 27. The new name became effective May 1. **Francisco Chairez** has been appointed manager of this company's Mexican operations with headquarters at Mexico City, according to an announcement by **Joseph A. Holmes,** president.

Richard W. Torbert
Linde

DuVal Cravens
Pole Sprayers

OSMOSE WOOD PRESERVING COMPANY—DuVal Cravens has been elected president of **Pole Sprayers, Inc.,** an Osmose subsidiary, according to an announcement by **John L. Surdam,** president of the parent company. Mr. Cravens will retain his position as a vice-president of Osmose. Headquarters of both companies are located at 980 Ellicott Street, Buffalo, N. Y.

READE MANUFACTURING COMPANY—C. H. Reade, president of this company, has announced that, after a year and a half of successful operation, **Thermax Metallurgical, Inc.,** has been organized as a separate corporation. Officers of the new company are as follows: **L. J. Reade,** president; **C. F. Reade,** executive vice-president, and **J. H. Deppeler** and **W. C. Cuntz,** vice-presidents of operations. General offices and research laboratories of Thermax are located in Elmhurst, N. J.

The Thermit welding business was acquired from Metal Thermit Corporation in 1957 and has since operated under its present name as a division of Reade Manufacturing Company.

Mr. Reade also announced that, as a result of an intensive year-long research and development program, an improved Thermit rail weld has now been offered to railroads and rapid transit lines.

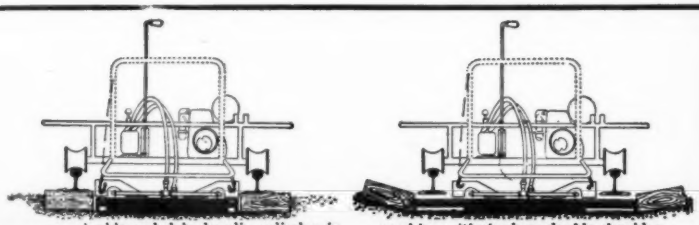
The new company has a manufacturing plant in Lakehurst, N. J., where production of materials and equipment has been under way for more than a year. Sales offices are located in Pittsburgh, Pa., Chicago and Livermore, Calif.

ROSS & WHITE CO.—A. D. Nicolay has been appointed sales manager of this company according to an announcement by **Carlton P. Ross,** president.

TEMPLETON, KENLY & CO.—The following appointments to vice-president have been announced by this company: **Frank Krickhan,** finances; **William Gahl,** engineering; **Roy Webb,** manufacturing and **A. C. Templeton,** sales.

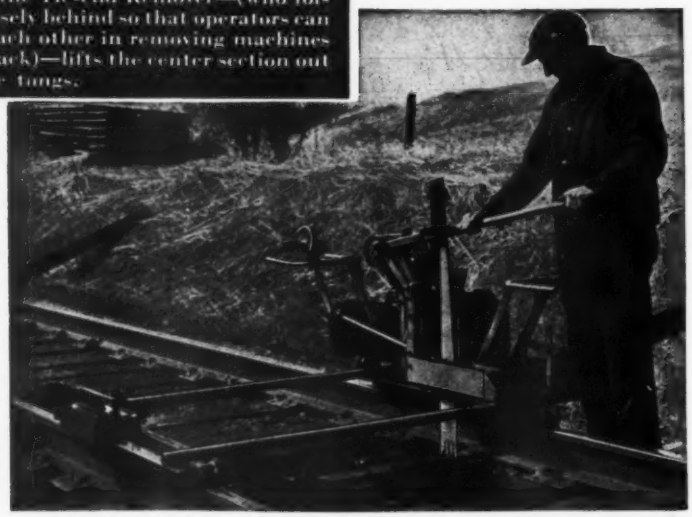
NO MORE TRENCHING!
NO MORE JACKING UP TRACK!

This **WOOLERY**
TIE-REMOVING TEAM
NOW ELIMINATES SLOW,
COSTLY METHOD



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.

After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.



Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

WOOLERY
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14

the improved GAUTIER

the finest in **RAIL ANCHORS**

STRENGTH
DURABILITY
ECONOMY

Made of Alloy Spring steel, the Improved Gautier is one of the heaviest and most rugged rail anchors on the market.

Manufactured exclusively by

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For maintenance of way, construction, use reliable

KOHLER ELECTRIC PLANTS

Portable Kohler models are designed to fit your needs perfectly for power tools, lighting—compact, 4-cycle, quick-starting, economical. Known for reliability everywhere. Larger models for work trains, communications. Sizes to 100 KW, gasoline and diesel. Battery charging plants, 6, 12, 32 and 110 volts. Write for folder F-7.

Model 2.5M25, *2500 watts, 115 volt, 60 cycle AC. Manual start. Also 230 volt, 3 phase, 180 cycle AC.*

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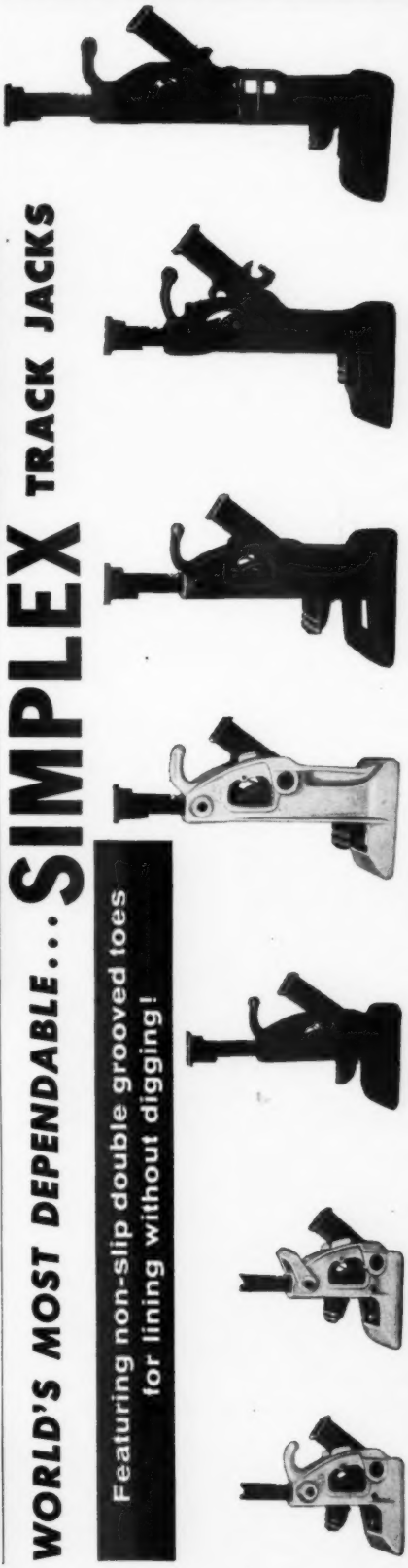
Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings
Electric Plants • Air-cooled Engines • Precision Controls

GET IN THE GROOVE!

WORLD'S MOST DEPENDABLE... SIMPLEX TRACK JACKS



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- Most complete line — twelve models
- Available with malleable or aluminum alloy housings
- Large area (2½" x 3¼") lifting toe has non-slip grooves
- Lifting ranges from 5 inches to 19¼ inches
- Thumb guards and trips on both sides
- Lowest toe height—less digging or pounding to set jack

WORLD'S LARGEST MFGRS. OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS

SIMPLEX JACKS

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OR On The Line
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WORK POWER PAYS!

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Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

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with –

NATIONAL RAILWAY SPRING WASHERS

–on the job!

Powerful NATIONAL Spring Washers have demonstrated their ability to reduce maintenance costs. The reserve power, designed into these service-proven spring washers, absorbs shocks and assures constant bolt tension.

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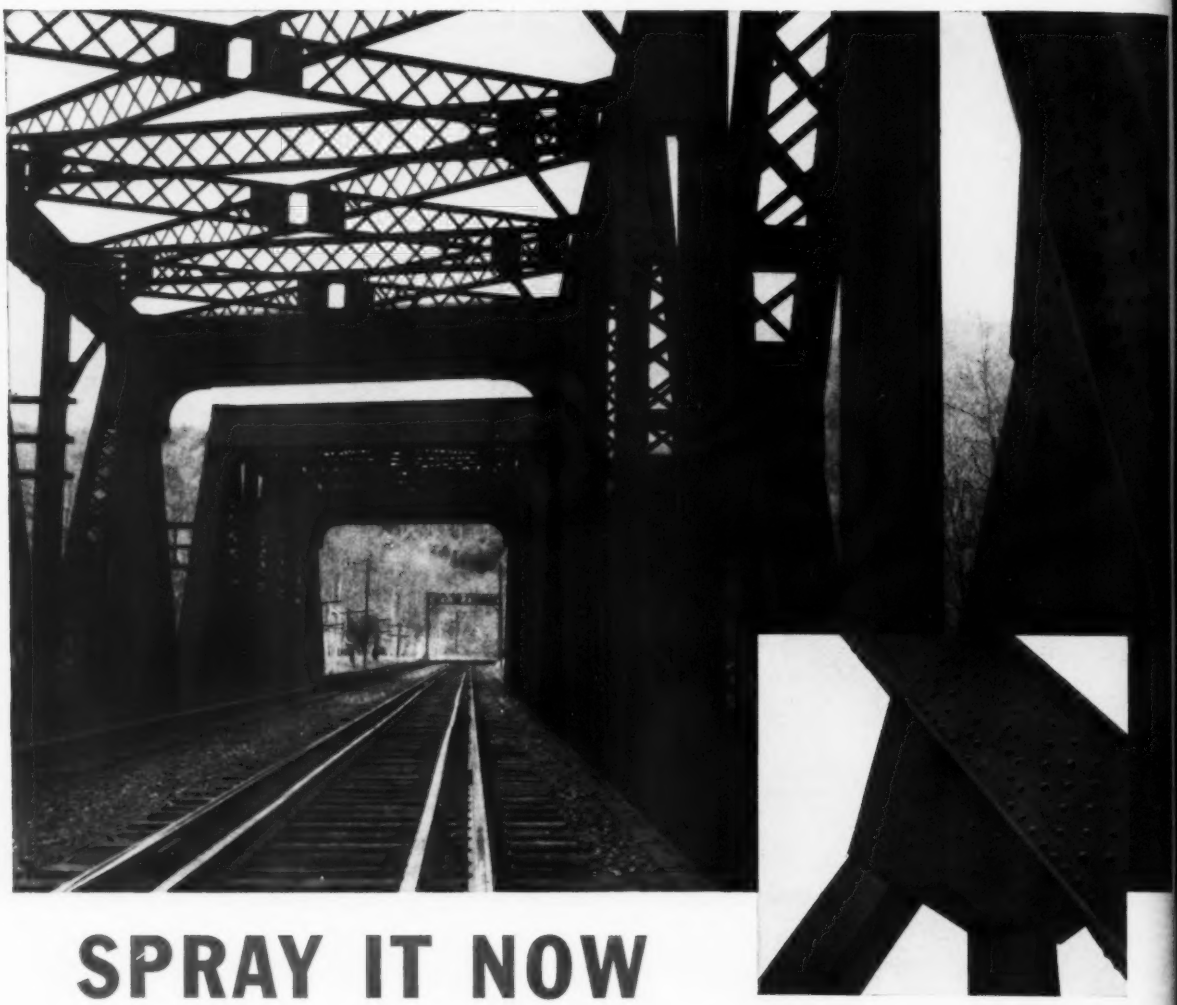
The NATIONAL LOCK WASHER COMPANY

Serving Industry Since 1886 – NEWARK 5, NEW JERSEY, U.S.A.



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Nothing protects bridge metal as economically as Texaco Metal Preservative. Comparative tests conducted by a major eastern railroad* prove it. Cost of material is much less and the work can be done in about one-third the time, with a minimum of scaffolding because no extensive wire brushing or chipping is necessary when Texaco Metal Preservative is used. Surface dirt is simply blown away with air supply in spray gun.

Texaco Metal Preservative penetrates scale and loose paint—causing it to fall off from traffic vibration. When this happens on badly corroded bridges a second spray coat will assure long-lasting protection against rust and corrosion.

Get all the facts on this long-lasting asphaltic metal preservative. Call the nearest Texaco Railway Sales Office. There's one in New York, Chicago, San Francisco, St. Paul, St. Louis and Atlanta. Or, write Texaco Inc., *Railways Sales Division,* 135 East 42nd Street, New York 17, N.Y.

*Name on request.

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